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ON

DISEASES OF THE NOSE

AND ITS ACCESSORY CAVITIES

BY

GREVILLE MACDONALD, M.D.(LOND.)

PHYSICIAN TO THE HOSPITAL FOR DISEASES OF THE THROAT

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TO MY MASTER

SIR JOSEPH LISTER, Bart., F.R.S.

I DEDICATE THIS BOOK

G. M^cD.

PREFACE TO SECOND EDITION

THE fact that the first edition of this book was exhausted in little over a twelvemonth is sufficient to indicate that it was needed. The author has again endeavoured to incorporate in his treatise everything worth knowing on the subject. Several additions have been made, among the more important being articles on Croupous Rhinitis and Cysts of the Middle Turbinated Bone, subjects but imperfectly treated in the former issue. An enlarged experience on the association of asthma with nasal disease has considerably modified the author's views upon the point: consequently much of this section has been rewritten; while an article on Idiopathic Rhinorrhœa has been added to the Chapter on the Nasal Neuroses. New operations for the treatment of deviated septum and post-nasal adenoids have been described. Several important cases have been added to the Appendix, including thirteen to the table of those described as Empyema of the Antrum.

New illustrations have been added, viz. Figs. 56, 57, 58, 59, 63, 64, and 65; the author's statistics have been brought up to date, and the whole work has undergone careful revision.

The author has once more to express his obligations to his colleague Mr. F. G. Harvey, F.R.C.S., for reading and wisely criticising the proof-sheets; and to Dr. W. Aldren Turner for similar valuable assistance.

HARLEY STREET, W.,
January 1892.

PREFACE TO FIRST EDITION

THE author's main intention in producing this treatise on Diseases of the Nose has been to familiarise the general practitioner with a subject which has not hitherto received the attention it deserves. Consequently, he has attempted, not so much the production of a text-book, as a record of his own observations and the methods of treatment he has found advisable. It is hoped that by this means the reader will be spared the difficulty of deciding as to which method of diagnosis and treatment will best reward his pains. At the same time the author trusts he has not neglected to render due credit to the pioneers of nasal diagnosis, wherever they are responsible for points of which time and experience have proved the merit. In describing diseases of which the author has had little or no experience, he has endeavoured to place before the reader the opinions of the most trustworthy authorities.

The study of Rhinology is the newest in medicine, and very little has yet been effected in comparison with the extent of the field opened for investigation. It is earnestly hoped that while this treatise will prove of assistance to the general practitioner as well as to the specialist, it will serve even more as an introduction to an enlarged study of the subject. For there is little doubt that, in the course of a few years, when some prevalent exaggerations as to the remoter effects of nose-disease have died a natural death, the true importance of the subject will be fully appreciated; while some of the facts herein stated, it is hoped, will have become the common property of the profession. The laryngoscope is now generally in use; and it is the belief of the author that the study of the nose—a region even more accessible to treatment than the larynx—must prove of the greatest utility to the profession, and hence directly to the public.

The method of describing the different diseases presents little difference from that usually adopted. The volume opens with an inquiry into the physiology of the nose, only recently investigated: this has appeared to be of considerable importance, seeing that it has changed the whole aspect of the ætiology and treatment of nose-disease. More space than is perhaps usual has been devoted to the subject of prognosis, the author having attempted to indicate precisely what degree of benefit may be expected from any given line of treatment.

In closing these brief introductory remarks the author would avail himself of the opportunity of expressing his obligation to Sir Morell Mackenzie's book on *Diseases of the Throat and Nose.* Nothing could easily be written in this branch of medicine without the valuable assistance therein afforded. To his friends, Mr. F. G. Harvey, F.R.C.S., and Dr. Alexander Francis, of Brisbane, the author would express his thanks for rendering him considerable assistance in helping the book through the press. To both he is indebted for many valuable suggestions, and to the latter for a considerable share in the onerous work of compiling the index. Mr. P. S. Hutchinson has enhanced the value of the work by his masterly drawings in colour and on wood. The author considers himself most fortunate in having secured the services of an expert laryngologist, who is also an accomplished draughtsman. Mr. Hutchinson has made all the original drawings with the exception of Figs. 24, 25, 27, and 28, for which the author is responsible. The illustrations of instruments are, for the most part, from blocks kindly lent by their respective makers. With the exception of these, Miss Lilian Sweet, of 26 Kenninghall Road, Clapton, has executed the admirable and, in some respects, most difficult woodcutting.

March 1890.

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CHAPTER I

NASAL RESPIRATION

1. Investigation of the Respiratory Functions of the Nose. 2. The Structure and Function of the Inferior Turbinated Body. 3. The Relation of the Physics of the Nose to certain Pathological Conditions.

1. *Investigation of the Respiratory Functions of the Nose.*

IT is commonly held, and has been taught for many years, that the nose is the natural respirator; in other words, that so long as breathing through the nose is possible, there can be no need for any apparatus covering the mouth to warm, filter, and moisten the inspired current of air. This doctrine is now considered scientific by most medical men; consequently the artificial respirator is almost discarded, although not so completely as might be desired. Nevertheless, the true importance of nasal respiration in the economy has but lately received the attention it deserves; and experimental physiology has almost neglected the comparatively simple nature of investigations on the functions of the nose. Aschenbrandt, of Würzburg, was the first to examine the temperature and hygro-

Importance of nasal breathing hitherto only theoretical

metric conditions of air after passing through the nose.[1] His results closely agree with experiments recently made by myself,[2] though his methods are at once less simple and less trustworthy. Bloch, of Freiburg (Baden), has also recently experimented, adopting a system closely corresponding with my own, though not embracing the subject of gaseous exchanges occurring in the nose.[3] Naturally the pharynx, larynx, and trachea are the first organs to suffer from obstructed nasal respiration, seeing that upon these devolve nasal duties for which they are not specially adapted; and laryngologists are now generally teaching that the nose is of considerable importance in the effectual treatment of many cases coming under their special notice. Yet such observations have hitherto been based on a theory of nasal breathing rather than on physical fact.

Author's experimental investigation

At the beginning of an inquiry into disease of the nose, it will be not inopportune to recapitulate the conclusions arrived at by experiments on the functions of that organ, giving briefly the methods adopted for the examination. The full importance of the physics of the nose will be realised only when we come to consider the pathology and therapeutics of certain diseases.

To estimate the degree to which the temperature of the air is raised on passing through the nose, an ordinary piece of T-glass tubing is taken and one arm bent round till the extremity lies beneath the vertical portion (Fig. 1). At the angle of junction a small bulb is then blown; into the vertical portion is inserted

---

[1] *Ueber die Bedeutung der Nase im Respiration*, Würzburg, 1886.

[2] "On the Mechanism of the Nose as regards Respiration, Taste, and Smell," *Brit. Med. Journ.*, 1888, p. 1210. "On the Respiratory Functions of the Nose, and their Relation to certain Pathological Conditions," 1889.

[3] *Archives of Otology*, vol. xvi., No. 4, 1888.

Thermometric experiment

a thermometer graduated from 60° to 100° F. (15° to 37° C.), carrying an index, and fixed into the tube with a collar of rubber tubing (A). The bulb of the thermometer must fall well into that of the outer tube, but not so far as to come into contact with it. To the straight and bent arms are then respectively fixed a solid - rubber, perforated nipple (B), large enough to fit tightly into one nostril, and a piece of tubing (C) of sufficient length to be held between the lips when the instrument is *in situ*. The index then having been shaken down below 70° F. (20° C.), the whole of the apparatus is covered with carded wool, or enclosed in a flannel jacket, so as to exclude all sources of heat except that of the air passing through the tube. Next an observation is taken of the atmospheric temperature; and, after a full expiratory effort, the apparatus is fixed with the nipple (B) in one nostril, and the rubber tubing (C) in the mouth. Through the latter the air is inspired, and is immediately felt rushing in at the open nostril. That no air passes from the nose into the pharynx is proved by closing the rubber tubing with finger and thumb, when the respiration is immediately arrested. Four to six

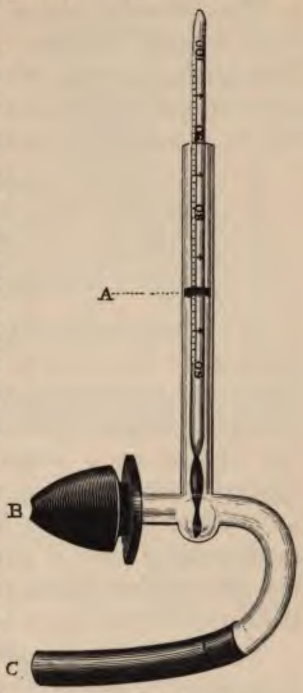

Fig. 1.

deep inspirations are generally sufficient to raise the mercury to the highest point. Expiration of course must be carefully conducted through the mouth.

Warming functions of the nose

The following are a few results casually selected from a great number of experiments on different individuals. In the left-hand column the atmospheric temperature is given, and in the right that to which the air is raised after passing through the nose:—

At − 7° C. the temperature was raised to 28° C.
At 1°·7 C. ,, ,, 35° C.
At 7° C. ,, ,, 34° C.
At 12° C. ,, ,, 35°·6 C.
At 45° C. the temperature was reduced to 33°·6 C.

A consideration of these tables indicates the remarkable fact that, at any rate between the above thermometric limits, whatever the atmospheric temperature, the inspired current of air, on passing through the nose alone, is raised or lowered in temperature approximately to that of the blood. And, in all probability, the results of the experiments would be more striking were it possible to include satisfactorily the mucous membrane of the post-nasal chamber in the area traversed by the inspired current.

Conditions modifying above

Cæteris paribus, robust subjects raise the temperature two or even more degrees higher than the anæmic. In the latter we generally have more or less collapse of the erectile tissue lining the inferior meatus. A noteworthy fact, moreover, is that cocaine applied in a 4 or 5 per cent solution, by its power of anæmising and inducing collapse of this tissue, lessens the acquired temperature by two or three degrees. These points might appear to throw some light upon the functions of the inferior turbinated bodies, although the small amount of difference in the observed temperatures during erection and collapse of these structures, perhaps indicates that they do no more than share the function of heating with the rest of the mucous membrane.

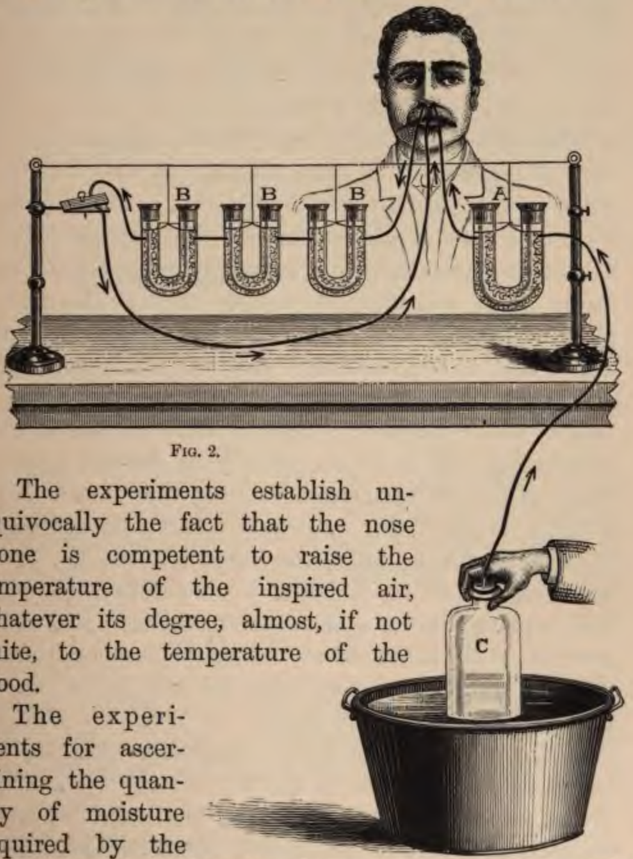

FIG. 2.

The experiments establish unequivocally the fact that the nose alone is competent to raise the temperature of the inspired air, whatever its degree, almost, if not quite, to the temperature of the blood.

The experiments for ascertaining the quantity of moisture acquired by the air on passing through the nose were conducted in a manner similar to that just described, but with the addition of more complicated apparatus. It was necessary to pass a known volume of dry

Humidity acquired by nasal air

air in at one nostril, and on its exit from the other, to collect the aqueous vapour absorbed by it. A reference to the accompanying woodcut (Fig. 2) will make a description more intelligible. An ordinary bell-jar (C), measuring four litres, its upper opening closed with a caoutchouc stopper carrying a glass tube, is connected by a flexible tubing with a large calcium-chloride vessel (A), and this in a similar manner with one nostril. A tube making its exit from the other nostril conducts the air through a series of three other calcium-chloride vessels (B, B, B), the last of which is once more attached to a tube conveying the air into the mouth. The act of inspiration through the mouthpiece necessarily draws air out of one nostril, in at the other, and finally exhausts the bell-jar. The latter is held by an assistant during the experiment over a bath of water sufficiently deep to allow of its complete submersion, and is allowed slowly to descend into the water as the air is exhausted; thus the volume of air respired is accurately measured. Immediately before the experiment is made, the calcium tubes (B, B, B) are weighed either together or severally; they are then replaced in the scheme, the tubes are fixed in the nose so as to admit of no leakage, the mouthpiece is secured, and the assistant holds the bell-jar in contact with the surface of the water. A slow, deep inspiration through the mouthpiece gradually exhausts the bell-jar as it descends in the water. As soon as the thorax is full, the tubes entering the nose are firmly grasped, and that in the mouth removed and closed, before expiration is permitted through the latter channel; the process is then repeated until the receiver is exhausted of air and filled with water. Twenty litres of air should be thus passed through the nose

Hygrometric experiment

before the calcium-tubes are again weighed. The difference in the two observations, allowance being made for the increase of volume due to the rise in temperature, will thus give the amount of water absorbed by twenty litres of dry air on passing through the nose.

The following table shows some results :—

Results of experiments

Subject, etc.	Temperature of atmosphere.	Temperature after passing nose.	Grammes of H_2O absorbed by 20 litres of dry air.
A.	17°·7 C.	34°·3 C.	1·170
B.	17°·7 C.	33°·8 C.	1·033
A.	20° C.	35° C.	1·024
B.	20° C.	34°·2 C.	0·775
A.	21° C.	35°·3 C.	1·963
A. With the erectile tissue collapsed under cocaine.	20° C.	34°·4 C.	0·681

As an indication of the true importance of these figures, it is necessary to determine the amount of water absorbed by twenty litres of air when completely saturated. This may be estimated by the following formula :—

$$\cdot 08936 \times 9 \times V \times \frac{273}{273+t} \times \frac{P}{B}$$

t = temperature at which volume is measured ; B = the barometric pressure ; P = vapour pressure of water at temperature of nose (41·8 at 30° C.) ; V = volume of air. Or

$$\cdot 08936 \times 9 \times 20 \times \frac{273}{273+16} \times \frac{41 \cdot 8}{760} = \cdot 835 \text{ grammes.}$$

This calculation, however, is based on the assumption that the barometric pressure within the nose is 760 mm. Thus ·835 grammes of water are contained in twenty litres of air, when saturated, at the temperature of the nose—an amount actually less than the experimental observations quoted above. Practically, however, the very fact that the inspiratory act consists in the formation of a vacuum within the thorax, and consequently in all the passages leading to it, clearly indicates that the barometric pressure within the nose during inspiration must be less than that of the external atmosphere. The lower the air-tension, the greater is the amount of aqueous vapour absorbed, *cæteris paribus.* And consequently it is only to be supposed that air at the intranasal pressure during inspiration would contain at saturation a greater quantity of water than at the external barometric pressure. And this the above experiments prove to be the case.

Air-tension in the nose during inspiration

The importance of the physical fact herein involved will become more apparent when we consider its relation to the production of disease, and consequently in relation to treatment.

From a consideration of the physics of respiration and the laws of gaseous mechanics, we must consequently assume that the amount of moisture taken up by the inspired air varies to a certain extent (1) with the rapidity of the inspiratory act; (2) with the degree of turgescence of the erectile tissue in the nose; and (3) with the calibre of the nasal passages—a point which varies considerably with the physiognomy of the individual, etc., or with morbid conditions of partial nasal stenosis. Yet in spite of such sources of variation, we shall not err in asserting that the air in passing through the nose alone is completely saturated with moisture, and that consequently physiologists are in error when they tell us that the lungs exhale moisture.

Conditions affecting humidity of air

Lungs do not exhale water

This they cannot do when the air reaches them already saturated.

Again, when we remember the enormous amount of heat rendered latent by the vaporising of water, we are struck with astonishment at the large quantity imparted by the nose, not only in raising the temperature of the inspired air, but even more in charging it with moisture.

Chemical changes

In determining the chemical changes occurring as the air passes through the nose, we adopt a method similar to that described in the previous experiments. The inhaled current of air is drawn first through a Liebig's or Geissler's tube to remove all traces of carbonic acid as it exists in the atmosphere; it then passes into a solution of baryta to indicate its freedom from the gas, and finally into the nose. As the air emerges from the opposite nostril it passes again into baryta, out of which it pursues its course to the mouth and lungs. The arrangement is shown in Fig. 3, the vessels A and

Qualitative experiment

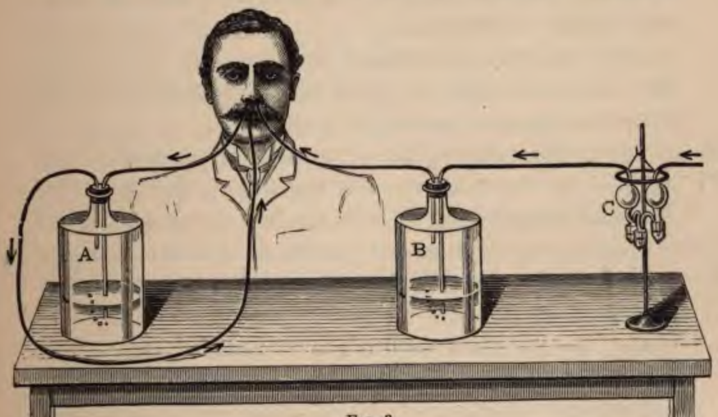

FIG. 3.

B containing the baryta water, and C the potash solution. Before placing the tubes in the nose and mouth a few inspirations must be taken through the nose and exhaled from the mouth, in order to empty the nasal chambers of any residue of carbonic acid as exhaled from the lungs. After the last exhalation the tubes are properly arranged as in the diagram, and a single inspiration taken through the mouthpiece. This is sufficient to cloud the solution in the bottle A, while that in B remains clear. As the air is drawn through by a single inspiratory act, it is obviously impossible for any air from the lungs to vitiate the observation.

This simple experiment incontestably proves the fact that exchange of gases takes place to a certain extent in the nose as in the lungs.

Quantitative experiment

For determining the quantity of carbonic acid exhaled by the nasal mucous membrane, the apparatus is more complicated. It is similar to that used for estimating the hygrometric condition, with the omission of the first chloride of calcium tube, as it is not necessary to dry the air before its entrance into the nose. In its place we have a Geissler's potash tube, and between this and the nostril an empty tube to collect any solution of potash that might otherwise enter the nose. As the air makes its exit from the nose, the acquired water is removed by three tubes containing pure chloride of calcium, although two are actually sufficient for the purpose. The current then passes into potash again, through another tube for collecting overflow, and once more through a single chloride-of-calcium tube, the purpose of which is to retain any moisture abstracted by the dry air from the potash solution. Finally, the air passes by a long piece of tubing into the mouth and lungs. Before beginning the experiment the final set of potash tubes must be carefully weighed; the increase of weight after the experiment will show the amount of carbonic acid contained in a known volume of pure air after passing over the nasal mucous membrane. It is sufficient to pass twenty litres through the nose, this involving the filling of the bell-jar five times.

Similar experiments were made at various atmospheric temperatures to determine whether the amount of carbonic acid given off by the nose be in any way commensurate with the different amount of heat contributed to the air in the different cases. In making the calculations, allowance was of course made in every case for the increase of volume in the air due to its rise in temperature on passing through the nose. The following table shows some of the results of the experiments:—

Results of experiments

No. of experiment.	Subject.	Atmospheric temperature.	Grammes of CO_2 given by nose to 20 litres of air.	Conditions.
1.	A.	15° C.	·033	...
2.	A.	14°·5 C.	·034	...
3.	A.	15° C.	·058	Face flushed and circulation quickened with alcohol.
4.	A.	15° C.	·023	Two hours later, face and circulation normal.
5.	A.	13° C.	·033	Immediately consecutive experiments.
6.	A.	1°·7 C.	·041	

[Table continued on next page.

TABLE—*Continued.*

No. of experiment.	Subject.	Atmospheric temperature.	Grammes of CO_2 given by nose to 20 litres of air.	Conditions.
7.	A.	1°·5 C.	·041	
8.	A.	1°·7 C.	·042	Immediately consecutive.
9.	A.	21° C.	·020	
10.	A.	1°·7 C.	·033	...
11.	A.	10° C.	·022	...
12.	A.	30° C.	·017	...
13.	B.	1°·7 C.	·039	Consecutive.
14.	B.	27° C.	·032	
15.	B.	4°·5 C.	·041	Consecutive.
16.	B.	37°·5 C.	·030	

From these experiments it will be seen (1) that a very considerable quantity of carbonic acid is contributed by the nose, amounting, in fact, as may be easily calculated, to nearly a fiftieth part of that yielded by the lungs; and (2) that the colder the external atmosphere the greater is the activity of oxidation in the nasal blood. But as the combustion of carbon is not sufficient in itself both to raise the air to the body-temperature and give the necessary heat to the aqueous vapour, as may be also easily reckoned, we must conclude that most of the heat is supplied by conduction and radiation. Yet we must assume it to be fact that, on the contact of colder air with the nasal mucous membrane, there is an immediate increase in the capillary blood supply with accelerated oxidation and elimination of carbonic acid.

Combustion of carbon in nose insufficient to generate heat supplied

This concludes the account of my experiments as well as some of their teachings. The latter I may now summarise in a statement concerning the physically ascertained functions of the nose, so far as its respiratory duties are involved:

Summary of conclusions from experiments

1. However low the atmospheric temperature, the air is raised almost, if not quite, to the temperature of the blood, on passing through the nose alone and before reaching the pharynx.

2. However dry the external air may be, on passing through the nose it is completely saturated with moisture.

3. Gaseous exchanges take place in the nose between the gases of the blood and those of the air to a not inconsiderable extent. Moreover, the quantity of carbonic acid exhaled by the nasal mucous membrane is, to a certain extent, proportionate to the number of degrees in temperature to which the air is raised. This increase in the supply of heat is probably due partly to increased conduction, radiation, etc., of heat from the augmented blood-supply to the mucous membrane, and partly by direct increase of oxidation in that and the subjacent structures.

2. *On the Structure and Function of the Inferior Turbinated Body.*

Erectile property of mucous membrane

The peculiar erectile property of the mucous membrane covering the inferior turbinated body has been a matter of speculation and interest for many years. But in the light of the important functions performed by the nose, it gains additional interest; and it will prove advantageous in this place to inquire more minutely into its anatomy, its method of tumefaction, and the purpose which it thereby fulfils.

In removing with the cold snare hypertrophied portions of the erectile tissue, especially the enormous growths that occasionally project backwards from the posterior extremity of the inferior turbinated body, I have succeeded in obtaining microscopical specimens in which the vessels are injected with blood. In this condition a very cursory examination is sufficient to manifest the whole structure and mechanism of these bodies.

Micro-scopical characters of erectile tissue

We find three well-defined layers: (1) the epithelial, (2) the fibro-vascular, and (3) the submucous, in which are contained racemose glands and the venous sinuses to which the erectile property is due. These sinuses form a loose, spongy network with little connective tissue separating their walls. When distended, the latter are seen to consist of a thin layer of connective tissue, apparently not elastic, and lined with an endothelium continuous with that of the veins which open directly into them. When empty the walls become corrugated and lie in close contact with one another. The arterioles, frequently tortuous, but becoming straightened when the structure is distended with blood, or when the connective tissue is œdematous, run directly towards the surface, and there ramify in capillary vessels. These are gradually united

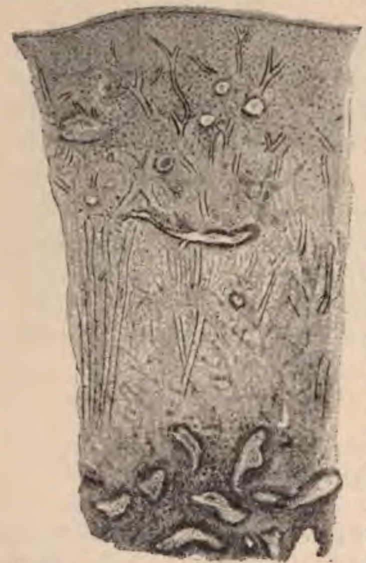

FIG. 4.—Showing arrangement of vessels of erectile tissue.

Anatomy of venous sinuses

into the radicle-veins, which, in their turn, pursue a more or less direct course towards the venous sinuses, into which they immediately empty their contents (Figs. 4, 5, and 6).

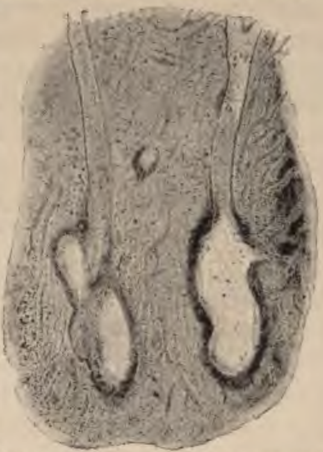

FIG. 5.—The same more highly magnified, showing veins opening into venous spaces.

All the specimens I have examined unquestionably reveal this arrangement, and appear to set at rest the long-disputed mechanism. In the fibro-vascular and submucous layers there appears to be a considerable development of elastic tissue, to which is doubtless due the property the venous network possesses of emptying itself as soon as the blood-supply is cut off by contraction of the arterioles. Thus the mechanism of erection and collapse of the inferior turbinated body is quite simple.

Mechanism of erection

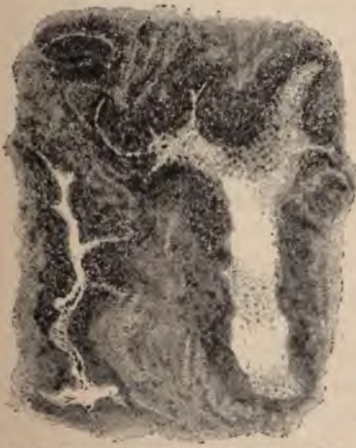

FIG. 6.—Two venous spaces, one collapsed and the other partly distended.

History of investigation of erectile tissue

Toynbee was probably the first to refer specially to the erectile property possessed by the nasal mucous membrane,[1] while Kohlrausch described venous loops arranged vertically to the bone, which he injected from the jugular vein.[2] But to Bigelow, of Boston, is rightly ascribed the merit of discovering the truly erectile property of the cavernous structures of the nose.[3] He says that the thin *trabeculæ* and walls, composed mainly of connective tissue, closely resemble the *corpora cavernosa* of the penis; although in the latter the smooth muscular element, as also the *tunica albuginea*, is somewhat more pronounced. I have failed to discover muscular fibres in the *trabeculæ* of the turbinated bodies, although Bosworth, of New York, subscribes to the statement;[4] while there is scarcely anything that can be said to correspond with the *tunica albuginea*. Moreover, the mechanism of erection appears to be quite different. For, although we find tortuous arteries, as I have remarked, yet they are scarcely identical with the helicine arteries of J. Müller, as Bosworth appears to assume,[5] seeing that they never open into the venous spaces directly. The last-mentioned observer has more recently denied the existence of a venous erectile tissue, though on what grounds is not very clear.[6] Sajous, of Philadelphia, describes the capillaries as opening abruptly into the venous sinuses,[7]—an observation that I am satisfied is not correct.

Function of erectile tissue

The function of these erectile bodies appears to be that of increasing the area of mucous membrane over which the air passes, more especially when additional moisture is required. For instance, after exposure to cold we find the bodies assuming their greatest proportions; while, in an atmosphere supersaturated with moisture, they are often found collapsed. This last statement requires qualification, however, as the patients on whom the observations were made had been breathing an atmosphere not only foggy but charged with the irritants of London smoke. Further experiment is needed upon this point.

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[1] *Diseases of the Ear*, 1868, p. 200.
[2] Müller's *Archiv.*, 1853, p. 149.
[3] *Boston Med. and Surg. Journ.*, 1875.
[4] *New York Med. Journ.*, 1886, p. 327.
[5] *Trans. Int. Congr.*, 1881, vol. iii. p. 327.
[6] *New York Med. Journ.*, 1886, p. 492.
[7] *Diseases of the Nose and Throat*, 1881, p. 16.

Chiefly secretory

The mechanism of erection appears to be vaso-motor. Increased blood-supply overfills capillaries, veins, and sinuses; the latter become over-distended and produce tumefaction of the whole structure. Presumably also, the filling of the sinuses induces a stagnation of blood in the veins and an increase of pressure in the capillaries and arterioles, thus augmenting transudation and secretion: a process similar to that obtaining in the kidneys, where free secretion into the Malpighian body is facilitated by the high arterial pressure due to the double system of capillaries through which the blood passes. That some such regulation in the secretion from the turbinated bodies is necessary will be readily conceded when it is remembered that the colder the atmosphere, *cæteris paribus*, the greater the amount of moisture necessary for saturating the air, raised to the blood temperature, with aqueous vapour.

No sooner is the arterial supply arrested than the sinuses are able to empty themselves, owing to the elastic property of the tissues in which they lie. And it is thus that cocaine, by inducing contraction of the arterioles, checks the supply of blood to the sinuses, and so causes collapse of the spongy bodies.

3. *The Relation of the Physics of the Nose to certain Pathological Conditions.*

Certain hypertrophies in the nose not the result of inflammation

Certain nasal and pharyngeal diseases are more obscure in their ætiology and pathology than ordinary inflammatory affections, because in their structure they are so simple that, on anatomical grounds, they can scarcely be considered the products of morbid activity. They comprise certain hypertrophies of normal tissues which demand treatment perhaps oftener than ordinary inflammatory products. Such obstructions include (1) post-nasal adenoid growths; (2) true hypertrophy of the inferior turbinated body; (3) ecchondroses, exostoses, and deflections of the septum. With each of these there exists no structural point to distinguish it from the normal tissue in continuity with which it grows. This will probably be at once admitted, except perhaps for the hypertrophied inferior turbinated body. The actual increase of all the elements of which this latter consists—venous sinuses, fibrous, elastic, and adenoid tissues, glands, etc.,—is beyond all question; so far there being no evidence of inflammatory action. The point in which the hypertrophied differs from the natural tissue is in the œdema of the fibro-vascular layers of the mucous membrane; while there are generally some appearances which might be correctly construed as inflammatory. From a consideration of the physiological conditions, however, of œdema, there is no reason for believing this to be necessarily of an inflammatory nature, as will be presently argued.

Allowing these affections to be mainly the result of physiological hypertrophy, the question naturally arises as to whether any special conditions exist in the nose that would induce a supply of blood greater than is needed for the maintenance of the normal nutrition. Why, we naturally ask, should this tendency to hypertrophy be found especially and so frequently in the nose? and that, moreover, in structures so different as bone, cartilage, lymphoid tissue, and venous sinuses? May we not possibly find some common factor that will account for all these changes?

Can they be accounted for?

Before discussing these questions, reference must be made to some of the experiments already detailed, and the facts deduced from them.

In determining the hygrometric condition of the air after passing through the nose, it will be remembered that where, from any cause, we have difficulty in nasal inspiration, the amount of moisture absorbed is considerably increased. This fact was satisfactorily explained when it was remembered that the barometric pressure within the nose is necessarily diminished under the conditions in question, and that, as a physical consequence, the attenuated air would absorb more moisture. The physical fact of course is obvious enough; yet the experiments show in a very forcible manner that, whenever there is nasal stenosis, there must be diminished air-tension behind the seat of stenosis, so long at any rate as respiration is conducted through the nose, and not through the mouth.

See p. 8

Now all fluids, whether liquid or gaseous, obey the same laws, and tend to fill any vacuum with which they are in communication. Hence not only does air rush in at the nose, but the blood-vessels—arteries, capillaries, and veins—which line the vacuum become overfilled. This fact is easily submitted to ocular demonstration. If with a Siegle's pneumatic speculum the air be partially exhausted from the external

Physics of the nose account for hypernutrition.

auditory meatus, the walls and *membrana tympani* are immediately suffused with blood. Increased blood supply means increased nutrition, while this necessitates hypertrophy of the tissues supplied. Bosworth has insisted upon "the influence of diminished atmospheric pressure due to nasal stenosis upon the mucous membrane of the air passages beyond the point of obstruction, as leading to dilatation of the blood vessels and weakness of vaso-motor control, thus giving rise to attacks of hay fever in the nasal chambers, and spasmodic asthma in the bronchial tubes."[1] And without waiting to indicate the fallacies of such a theory in this place, we can readily understand that this increased blood-supply must of a physical necessity lead to hypertrophy of structures behind the seat of stenosis. In children lymphoid tissue, wherever situated, shows a strong tendency to hypertrophy upon slight provocation; so that it is quite intelligible that such structures as the naso-pharyngeal adenoid tissue, and perhaps also the tonsils, should be among the first to suffer from this barometric hyperæmia.

Conditions predisposing to œdema

Under the same conditions it would be probable that the whole of the inferior turbinated body should become hypertrophied in consequence of the increased intra-vascular pressure. The œdema, moreover, of the fibro-vascular layer may be accounted for in the same manner. According to Cornil and Ranvier, the conditions most favourable to the production of œdema are venous obstruction and increased capillary pressure,[2]—the very conditions indeed which necessarily, in obedience to physical laws, obtain when the air-tension in the nose is unnaturally reduced. Venous obstruction is induced, owing to the pressure within the veins exceeding that of the partial vacuum which they line, while the intra-capillary pressure is also increased for the same reasons.

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[1] *New York Med. Journ.*, 1886, p. 492.

[2] *A Manual of Pathological Histology*, London, 1880, p. 251.

Objections to theory advanced

It may be objected that if inspiration through a constricted passage produces a minus pressure, expiration will exert the opposite effect, and thus the equilibrium in the blood-supply will be maintained. Moreover, it will doubtless be remembered, as a physiological fact, that the air-tension within the respiratory cavities is greater during expiration than inspiration. This, were we discussing perfectly normal conditions, would destroy the theory advanced. But we are dealing with abnormal stenosis, which, as will be immediately shown, reverses the conditions of pressure. For the purpose of demonstrating this experimentally, I have constructed an instrument which may be called the naso-manometer (Fig. 7). It consists of an ordinary U-shaped, mercurial pressure-tube, one arm being conveniently bent, so that it may be firmly fixed in one nostril. Resting on the summit of the mercury in the other arm is an iron weight, attached to a string passing over a pulley, and kept

The naso-manometer

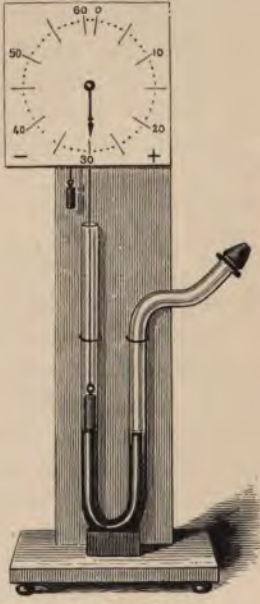

Fig. 7.—The Naso-Manometer.

tense by a small weight fastened to its free extremity. The pulley rotates a pointer over a dial graduated in magnified millimetres. On attaching the nose-piece of the instrument firmly in one nostril by means of a rubber nipple, the subject breathing naturally and easily through the other, the pointer indicates the intra-nasal pressure of the air as it passes in and out; and consequently, as accurately, any obstruction to the easy entrance of air. In the latter case we find that the minus pressure of inspiration is much greater than the plus pressure of expiration, and that the greater the degree of stenosis, the greater the difference between the two observations. The same remark applies whether the respiration be easy or forced. And, as a matter of clinical observation, patients suffering from nasal stenosis frequently volunteer the information that expiration through the nose is so much easier than inspiration.

Donders's experiments

Donders gives us the following as the result of his experiments:—During quiet breathing inspiration indicated −1 mm. (Hg), and expiration +2-3 mm.; while forced inspiration showed −57, and expiration +87. As a matter of experiment, any individual with normal air passages may verify these figures with the instrument above described; and then by partly closing the open nostril, and thus obstructing the access of air, he can substantiate my observations as to the pressure-conditions in stenosis of the nasal channels.

Discrepancy in physiological and pathological conditions

It is a little difficult to account for the discrepancy in the physiological and pathological conditions. That, when there is nasal obstruction, the air-tension should be hardly augmented in easy expiration may be accounted for by the fact that in such a state there is no muscular effort, and that, the air being expelled merely by the elasticity of the chest walls, the overflow is rather delayed than the pressure of the air increased. Similarly in forced breathing the power of the muscles of inspiration greatly exceeds that of the expiratory.

Again, it may be objected that in the event of any obstruction impeding easy breathing through the nose, the patients instinctively adopt mouth-breathing. But, that this does not invariably hold in cases of partial or transient nasal stenosis, I have frequently observed. The mouth may be shut and breathing performed through the nose; yet we see during inspiration that falling in of the structures lying between the jaw and the larynx, and the exaggerated descent of the latter towards the thoracic cavity which indicate so plainly lessened atmospheric pressure within the respiratory chambers. In normal breathing the anterior triangles do not perceptibly move, while the descent of the larynx is so slight as to be scarcely obvious. Moreover, I have observed that in post-nasal obstruction the instinct of nasal breathing, even when contending with great difficulties, generally asserts itself during sleep; and this although the patient allows the lower jaw to fall and holds the mouth apparently open. The snoring indeed, in these cases, so far from being the result of the open mouth, is generally due to the great difficulty with which the air is drawn through the nasal chambers.

Buccal respiration

Cf. p. 251

It yet remains to be shown that nasal stenosis of some sort is the usual starting-point of those structural hypertrophies with which we are concerned. It is a matter of general observation that post-nasal growths are frequently accompanied by some form of anterior nasal stenosis. The most common is vascular tumefaction of the inferior turbinated body, with or with-

Stenosis often the starting-point of hypertrophies

out chronic rhinitis. And it frequently happens that some treatment is demanded for remedying this, beyond removal of the post-nasal growths, before nasal respiration is completely restored. Seeing, moreover, that these neoplasms often date from an attack of measles or other exanthem, we may assume that a catarrhal obstruction antecedes the structural. Of more value as possible sources of obstruction leading to subsequent hypertrophy are the abnormally small nostrils so frequently seen in the affection, together with the narrowness of the nasal fossæ from congenital osseous malformation. But this point will be further discussed in describing the disease in question.

See p. 257

In obstructions arising from hypertrophy of the inferior turbinated body, whether anterior or posterior, we generally have a history of chronic rhinitis, which would, from vascular swelling, induce the primary obstruction.

If there be any doubt as to the applicability of the theory to anterior enlargements of the body, we must remember that hypertrophy in this situation is never encountered without the whole length of the structure being involved to as great an extent, while usually it increases as it proceeds backwards. And with such free intercommunication of the blood-vessels as we find in this cavernous tissue, it can scarcely be conceived that one portion would suffer without the other. Nevertheless, we sometimes find posterior hypertrophy with very little anterior, although invariably with much vascular swelling.

The fuller discussion of ecchondroses and exostoses in relation to the theory advanced must be deferred until the particulars of these diseases are detailed.

That the tonsils should also enlarge under diminished air-tension is quite conceivable, especially when they coexist with post-nasal growths and catarrhal nasal stenosis. Inflammatory action, however, has generally an important share in such hypertrophies. Yet many cases occur, both of post-nasal adenoids and ecchondrosis of the septum, where no mucous or muco-purulent discharge points to present inflammatory action. But in most cases there is more or less hypersecretion, due either to the hyperæmia or to direct irritation of the abnormal products.

Differences in nose and respiratory tract below

It is needless in this place to do more than refer to the pharyngeal and laryngeal changes that accompany nasal obstructions. With post-nasal growths we generally see some evidence of hypertrophic changes; while catarrh of the upper air passages is only too common in stenosis of the nose. But the nutritive changes are by no means so well marked below the nose, the walls of which are composed of rigid bone. The reason why pernicious results from the lowered barometric pressure are less often observed outside the nose is to be found in the fact just referred to, viz. that in the cavity of the nose the walls themselves are incapable of yielding to the external atmospheric pressure; whereas, lower in the respiratory track, the walls of the vacuum itself fall in, in response to the relatively heightened external barometric tension. This we can see in the neck and thorax during both pathological and artificial nasal stenosis; while pigeon-breast was pointed out many years ago by Dupuytren as closely associated with enlarged tonsils, though, according to Dr. Charles West, Shaw was the first person to offer the true explanation of it.[1]

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[1] *Medical Gazette*, 23d October 1841, quoted in Dr. West's *Disease of Infancy and Childhood*, 1874, p. 593.

Summary

A few words will suffice for summarising the theory here advanced. As a necessary consequence of physical laws, as well as from the teaching of direct experiment, it follows that where we have obstruction to the free access of air to the respiratory passages, there we have diminished air tension. Where the walls of this partial vacuum are yielding, their collapse probably tends to minimise the ill effects that would otherwise accrue. But where, as in the nose, the walls are rigid, all the blood-vessels lining them become overfilled, and a state of hypernutrition is induced, which in its turn tends to the increase in bulk of one or more of the tissues so affected. Thus are produced those hypertrophies and œdemas with which the rhinologist is so familiar, but at so much loss satisfactorily to account for.

CHAPTER II

EXAMINATION OF THE NOSE

1. Anterior and Posterior Rhinoscopy—Instruments.
2. Symptomatology of Nose Disease.

1. *Anterior and Posterior Rhinoscopy.*

Before proceeding to any description of the diseases of the nose, it is essential that some account be given of the methods of examination, the apparatus used, and the structures which are thereby brought into view, dwelling in this place, of course, only on the normal appearances. This is especially needed, seeing that some otherwise trustworthy text-books give but imperfect and sometimes even erroneous accounts of these matters. Indeed, probably no class of speculum-examination needs so much practice and patience before it can be employed with satisfaction.

Apparatus for anterior rhinoscopy

The apparatus required for anterior rhinoscopy is simple enough. Either direct sunlight, or good lamplight reflected from the forehead with the mirror used for laryngoscopy is preferable. The best lamp, where gas is available, is the Welsbach incandescent, as the light is whiter and less hot than that afforded by the ordinary Argand burner. It can be fitted to Mackenzie's lever-bracket arrangement (Fig. 8), or may slide on a vertical rod according to preference. Good oil lamps are sold for the purpose by all instrument-makers, but an iron chimney and bull's-eye are desir-

Light

able. The electric incandescent light may be used either by Leiter's (Fig. 9) or Trouvé's forehead apparatus requiring an 8-volt battery, or by a 10-candle lamp placed within the lamp-chimney, and reflected from the forehead. This requires an E. M. F. of 16 volts. But the great disadvantage in the electric light is the narrow bright line in the middle of the field of illumination, while the surrounding plane gives hardly sufficient light for most purposes. It is only in very exceptional cases that the limelight is advantageous. Besides a good light there are needed a few specula, a

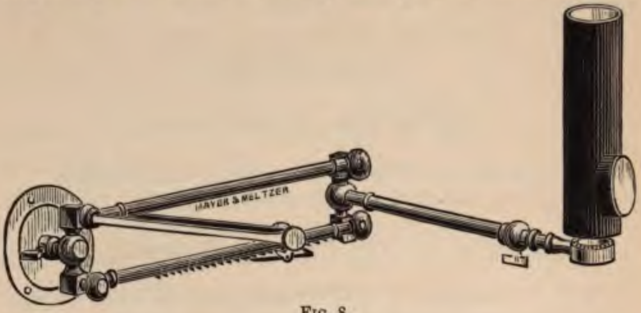

FIG. 8.

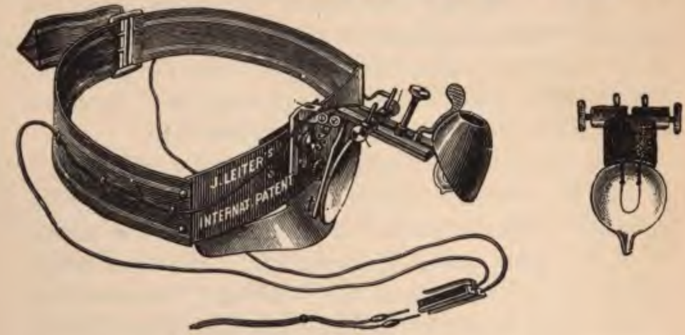

FIG. 9.

few probes, one or two small laryngeal mirrors, and a tongue-depressor. The form of speculum is not of much consequence, provided the blades are not fenestrated; otherwise the vibrissæ in the vestibule obstruct the view. Thudichum's instrument (Fig. 10), in two or three sizes, serves all purposes, and is sufficiently self-retaining. Cresswell Baber's, with the band passing over the head, is sometimes useful if made with solid instead of wire-frame blades. Fraenkel's (Fig. 11), the most frequently employed, has the disadvantage of fenestration. Duplay's (Fig. 12) is probably the most comfortable of all for the patient, though it is somewhat awkward for the manipulator. To Roth's the same objections apply. The probes should be fairly stout, having no bulbous enlargement at the extremity, seeing that they are frequently required to carry a mop of cotton wool wrapped round the point for purposes of cleansing, etc.; this, if the extremity be bulbous, is very difficult to remove. Of the mirrors, one should be bent at a right angle to the stem, the other at the angle employed for laryngeal purposes, viz. about 120°. The best

Specula

Probes

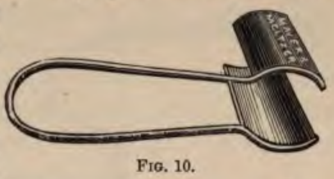

FIG. 10.

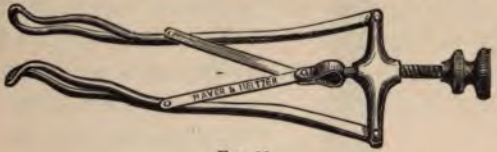

FIG. 11.

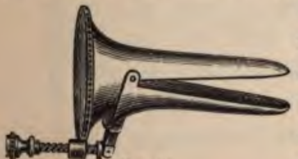

FIG. 12.

Tongue-depressor

Palate-hooks

tongue-depressor is Fraenkel's (Fig. 13), made an inch longer than usual. Rarely a palate-hook is of service; and so much sphincter-like contraction of the palate and constrictors of the pharynx is produced by its insertion, that it seldom proves to be of any practical utility. The most useful instrument is Voltolini's (Fig. 14). It consists of a solid, flat blade, bent at right angles, the palate portion being at least three-quarters of an inch long and half an inch wide. There are two flanges on each side projecting vertically upwards at the end of the buccal part, which hold the uvula out of the field of vision. Voltolini points out that the patient bears its application better when it is used forcibly and firmly, rather than gently and hesitatingly; a remark that is endorsed by experience.

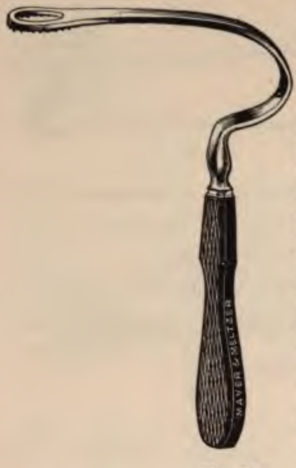

FIG. 13.

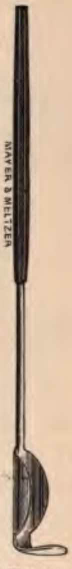

FIG. 14.

Another hook of some utility (Fig. 15), especially where, in operating upon the post-nasal structures, it is desirable to leave both hands free, is one designed by Dr. J. A. White, of Richmond, Va.,[1] and usually made with a slight modification suggested by Cresswell Baber. On the stem slides an attachment consisting of two flexible loops of wire, which, the instrument being in position, lie against the upper lip and retain the instrument. In applying it, the hook is first placed behind the palate and the patient directed to close his lips and breathe through the nose. This relaxes the velum sufficiently to allow of its being drawn forwards. The lip attachment is then pushed into position until it is firmly fixed against the upper jaw, the pressure preventing its slipping. The instrument is often made of aluminium.

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[1] *Journ. of Amer. Med. Ass.*, 1st February 1888.

Method of holding speculum

The manner of holding Thudichum's speculum is of some importance. With the blades directed towards the patient and the spring held upwards, the latter should be lightly grasped between the thumb and first finger, the dorsum towards the forehead, while the second and third are extended on each side, so that the examiner can regulate the force of the spring. Held thus no patient will complain of pain, which is the usual charge brought against the instrument.

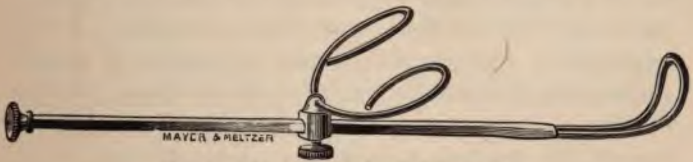

FIG. 15.—White's self-retaining palate-hook.

Inserted well between the alæ in this manner, and with the fourth finger resting on the bridge of the nose, we can easily alter the inclination of the speculum; and, by gentle pressure in one or other direction by the finger on the nose, we can change the position of the head as necessary—a requirement which will immediately be recognised as of considerable importance. Having the instrument in place and the interior illuminated, what structures are exposed?

Presuming the head to be sufficiently tilted back to afford the best view, and the projecting vibrissæ held on one side by the blades of the speculum, we see for a greater or less distance into the nasal fossæ (see Fig. 1 on Frontispiece). In the lower part we observe, standing out from the external wall, the inferior turbinated body, a fold of mucous membrane covering the inferior spongy bone, and including the plexiform arrangement of venous sinuses already described. This erectile tissue not only extends along the free border of the turbinated body, being especially developed at the anterior and posterior extremities, but also lines the floor and a portion of the septum. According to the degree of turgidity, we can see to a greater or less distance along the inferior meatus; but frequently the swelling is so great, although scarcely to be considered pathological, that the channel is completely blocked. After exposure to cold air, and during an attack of acute coryza, the inferior turbinated body becomes greatly swollen, and darker in colour than the usual bright red of its mucous membrane. Yet although this turgidity can hardly be considered pathological, it frequently comes under observation as a form of nasal obstruction, and as such requires definite treatment. If we investigate with a probe the nature of the inferior turbinated body when in a state of turgescence, we observe that it gives the impression of a sac loosely filled with fluid. Indeed it fluctuates; and on a first examination one can hardly be persuaded that it does not contain fluid other than the blood of its erectile structure. But the application of a 5 per cent solution of cocaine quickly restores it to its collapsed condition, and the true nature of the swollen tissue is revealed. Besides that on the inferior spongy bone and lining the inferior meatus, there is another mass of erectile tissue on the septum, a little lower than opposite the anterior third of the middle turbinated

Structures exposed

Erectile tissue

Diagnosis of turgescence

bone. This is as liable as the inferior turbinated body to erection, although its smaller bulk renders it less conspicuous: But the appreciation of its real character is quite as important, seeing that its turgidity may lead to the supposition that the middle turbinated body is in contact with the septum, whereas the erectile tissue is merely concealing the slit between the convex margin of the middle turbinated and the inner wall. According to the degree of prominence in the inferior turbinated body we see more or less of the free convex border of the middle spongy bone, between which and the septum there is a clear passage, called the olfactory fissure. The latter varies considerably in width even in conditions of health. These points are important to bear in mind, seeing that in certain inflammatory conditions the middle turbinated tissue is found in contact with the septum, and the physiological may be mistaken for the pathological, or *vice versâ*. Between the free margin of the bone, curved inwards on itself, and the outer wall of the fossa is a deep sulcus, corresponding with the concavity of the spongy bone, so that the free margin appears to hang downwards from the roof. It must be observed that between the anterior extremity of the middle spongy bone and the nasal process of the upper jaw there is a free passage, which, however, is considerably narrower in the living subject than in the skeleton. In pathological conditions it may be obstructed.

Importance of distinction between physiological and pathological swelling

Olfactory fissure

That portion of the fossa which lies below the upper margin of the inferior spongy bone is commonly spoken of as the inferior meatus; into it anteriorly opens the naso-lachrymal canal. Between the concavity of the middle turbinated bone and the convexity of the inferior extends the middle meatus, into which open, above and anteriorly, the anterior ethmoidal cells.

Boundaries of the meati

Cavities opening into the meati

On the outer wall, between two and three inches from the orifice of the alæ, is found the semilunar hiatus lying between the upper margin of the unciform process, and the projecting ethmoidal cell, named by Zuckerkandl the *bulla ethmoidalis.* Upwards, this crescentic and valvular opening leads into the infundibulum, giving access to the frontal sinus; while running backwards, downwards, and somewhat outwards, curving under the bulla, it leads into the *ostium maxillare.* There are occasionally other accessory openings into the antrum; while it must be noted that the outer wall of the infundibulum is often separated from the cavity of the antrum by the two layers of mucous membrane alone. This point is of importance in relation to the flow of pus from the upper portions of the nose into the cavity of the jaw.

Bulla ethmoidalis

Deviation of the septum

In the majority of individuals we find more or less deflection of the septum, with the greater or less development of bony ridges running from before backwards. The most frequent site of the deviation is at the junction of the vomer with the perpendicular plate of the ethmoid and the triangular cartilage. This malformation, for such it must be considered, although the rule rather than the exception, is chiefly interesting at this stage of the examination, because of the difficulty it causes in examining properly the side encroached upon. It is always associated with more or less thickening at the point where the curvature is sharpest. Sometimes we find the thickening without deviation; in which case it is more likely to be symmetrical on both sides.

Posterior rhinoscopy

Posterior rhinoscopy is at once more difficult and easier than anterior. It is effected by inclining the laryngeal mirror upwards behind the soft palate. The difficulty consists in placing the mirror in position;

but that effected, the structures brought into view are fairly easy of comprehension.

Methods

In ordinary cases a small laryngeal mirror is needed, with stem strong enough to serve as a tongue-depressor. For examining the septum, turbinated bodies, and vault, the angle of the mirror should be made a right angle; while for investigating the posterior naso-pharyngeal wall, the angle should be as wide as that of the laryngeal mirror. Fraenkel's pharyngeal mirror (Fig. 16), the inclination of which can be altered at will, is by some considered a necessity. Sometimes it may be advantageous to use a tongue-depressor as well. In any case the mirror must be gently carried behind the uvula without touching either it or the posterior wall of the pharynx. The advantage of dispensing with the tongue-depressor is that, with the left hand, one may steady the patient by holding his chin. But whatever plan is adopted, he must be persuaded that the examiner is master of the situation. Firmness and gentleness are at once required for this sometimes exceedingly difficult operation. Often one may cause relaxation of the soft palate by asking the patient to breathe through his nose, or by requesting him to breathe in and out of his mouth as slowly and gently as possible. Yet the longer one takes the more difficult does the examination become. Sometimes the application of a 5 or 10 per cent solution of cocaine in conditions of great irritability may be advisable; although only too often, in spite of producing anæsthesia, it aggravates the tendency to reflex-action and retching. Very rarely is anything

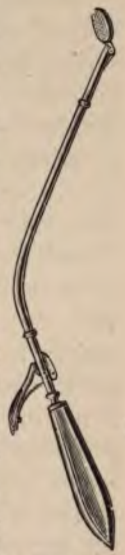

FIG. 16.

gained from the assistance afforded by a palate-hook. Of course one should aim in this, as in all surgical manipulations, at effecting his end with the simplest means and least display of apparatus.

Structures exposed

Having the angle of the mirror pressing on the back of the tongue, and the upper edge of the reflecting surface just below and well behind the margin of the pendulous palate, a view of the post-nasal structures is obtained—a view, however, pieced together by a series of altered inclinations of the mirror. We see the two choanæ separated by the vertical, in this situation very rarely deflected, septum (see Fig. 3 on Frontispiece). Into these project, downwards and inwards, the three, sometimes four, turbinated bodies with their intervening channels. The inferior meatus, owing to the prominence of what is called the uvula cushion, frequently appears as no more than a narrow slit, while often the whole of the inferior turbinated body is hidden. The middle meatus is not infrequently contracted by congestion or œdema of the erectile tissue covering the bone below, while the superior meatus may appear to possess an unwarranted importance, seeing that it is only fully developed posteriorly. The spaces may be further encroached upon by an unusual prominence of the mucous membrane on each side of the septum. As this also will subside after the application of cocaine, we may conclude that it also consists largely of erectile tissue.

Meati

Eustachian tubes

Externally to the choanæ we see the yellowish openings of the Eustachian tubes, with the salpingo-palatine folds in front, and the salpingo-pharyngeal folds behind. Externally to and behind this again is Rosenmüller's fossa, into which the Eustachian catheter sometimes inadvertently passes. At the highest point of the cavity, a little posteriorly, may sometimes be distinguished the raised collection of lymphoid tissue described as Luschka's tonsil, in the centre of which a depression may occasionally be seen. Running downwards on each side of this are not infrequently observed two parallel folds of mucous membrane, one on each side of the central raphe; but it is often impossible to say if, or at what point in its extent, it should be considered pathological. When these structures are associated with certain morbid conditions, they have been held by Tornwaldt, of Dantzig, to denote a disease *sui generis*, which, however, is hardly admitted by most observers.[1]

Luschka's tonsil

The normal colour of the nasal and naso-pharyngeal mucous membrane is not very easy to determine in a city like this, where nearly every one suffers from more or less nasal catarrh. In front the darkest portion is the inferior turbinated body, the middle being much paler. Posteriorly the structures projecting into the choanæ should present a pale gray colour, somewhat œdematous-looking; while the mucous membrane of the naso-pharynx in general may be described as pinkish-gray, becoming darker in colour as the pharynx is approached.

Colour in health

2. *The Symptomatology of Nose Disease.*

In the future description of the different diseases of the nose, the symptoms special to each will be severally related; yet it will be useful at the outset of the study of rhinology to pass in review some of the principal subjective symptoms, as well as a few objective not demanding special instruments for their investigation.

Among the first we have most notably obstruction of the nasal passages. Its special features will be

Nasal obstruction

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[1] *Journ. of Laryng. and Rhinol.*, February 1887; article, "The Pharyngeal Bursa."

detailed under the different diseases by which it is caused. But it may be here noted that it is a trouble for which in itself the patient less frequently seeks relief. Even when the stenosis is complete, he so soon grows accustomed to it that he often realises the distress only when relieved of it by the surgeon. The open mouth is a sure sign of nasal obstruction; while, when the nose is but partially stenosed, we observe the patient taking only an occasional breath through the mouth.

It may here be observed, to obviate unnecessary repetition, that it is not enough that the patient asseverate his ability to breathe through the nose: we must convince ourselves of the fact. For reasons already detailed, it is very doubtful whether nasal respiration ought to be enforced if the patient instinctively adopts mouth-breathing. Thus it is no proof of the sufficient patency of the nose that the patient is able, so long as he *tries*, to breathe through it; he ought to perform it unconsciously and continuously, at rest and during exercise. An important help in the determination of this point is sometimes afforded by inquiring whether the patient wakes in the morning with his mouth open and his tongue parched, and whether he snores. The last point is of more value in children, in whom snoring invariably points to nasal obstruction, even when breathing is conducted through the nose. Adults not infrequently snore when there is no nasal stenosis; and, much more frequently than children, refrain from the practice, although there be considerable obstruction in the nose. When the stenosis is of long standing, the mouth assumes a stupid, characterless appearance from lack of use: hence the lack of expression in the buccinator. From a similar want of use in the *dilatores alæ nasi*, the nostrils may become perma-

Precise diagnosis of obstructed nose

nently collapsed. This appearance is especially frequent in the subjects of post-nasal adenoids.

Abnormal width of fossæ

Still less is the reverse condition in itself a matter of complaint, although abnormal patency of the nasal fossæ is an actual source of disease; this arising primarily from the fact that the inspired current of air has too great a latitude to bring it sufficiently in contact with the moistening and warming walls. This fact will be developed in the course of the treatise. The more immediate consequences of too great width in the nasal fossæ are dry pharyngitis and more or less severe laryngitis.

Pharyngeal and laryngeal inflammation results, in those predisposed, from nasal stenosis

A word or two in this place concerning the pharyngeal and laryngeal inflammations, so far as they are symptoms of nose-disease, will not be inopportune. It must not be supposed that buccal respiration invariably results in mischief to the upper air-passages: witness the impunity with which a tracheal cannula is worn for many years without any evidence of tracheitis or bronchitis. Yet we must accept it as fact deducible from clinical observation that, where there exists either a local or constitutional susceptibility to catarrh, in such patients the healthy performance of nasal respiration is of the greatest importance. And as a matter of therapeutic experience, it will be found that in many a case of chronic laryngitis nothing can be effected so long as the nose is diseased; while, on the contrary, after rectifying the nasal abnormalities, the larynx may require little or no treatment for itself.

Nasal speech

When the nasal spaces are abnormally wide, a slight enfeeblement of the palate is sufficient to give the speech a nasal quality the reverse of that due to nasal obstruction. It acquires a nasal tone, and approximates, when well developed, the utterance of the cleft-palate patient. Thus *d* may approximate to *n*, and *b* to *m*; *g* hard may be almost an impossibility; while *s* and *ch* are also difficult. But beyond such palpable deficiencies there is more that cannot be easily described. The speech is thick, difficult of comprehension, nearly all consonants being more or less blunted, and nasal. An exaggerated nasal intonation is produced by the speech passing partly into the nose and there meeting some obstruction. Possibly enough the so-called Yankee twang is due to an enfeebled palate; and it is by no means unlikely that this is more frequent across the Atlantic, when we remember the prevalence there of post-nasal catarrh, one of the chief causes of enfeebled action of the palate.

Paresis of palate

This paresis of the palate, as it has been called, may be due to several conditions, both local and constitutional. It is commonly associated with post-nasal catarrh, and often with dry rhinitis; but it is most marked when hypertrophies of the inferior turbinated body are pressing on its upper surface. The general maladies in which it is seen are conditions of anæmia and enfeebled neuro-muscular action, the latter being most often aggravated in this situation when the patient is suffering from voice-fatigue, as in clergymen and elementary-school teachers. It depends probably on muscular enfeeblement, due either to constitutional conditions or to the local congestion of the mucous membrane that covers so intimately the muscular structure, rather than upon any reflex-action, as is maintained chiefly upon theoretical grounds by some authorities.

The degree of paresis in the palate is a matter of some importance; we may see it hanging so low that it descends vertically from the hard palate and readily permits a post-nasal examination; yet there may be no suspicion of it in the speech. When this is the case, the palate is still fairly responsive to tactile stimulation; if we touch it sharply with a probe, it will rise and completely approximate itself to the posterior wall, and even draw the uvula completely out of sight. But in those cases where the speech is affected, we may find the muscular tissue quite unresponsive to such stimulation.

While such muscular enfeeblement is chiefly noticeable in the palate, it affects to as great an extent the constrictors of the pharynx. They also sometimes fail to respond to tactile stimulation, as the result of a local catarrh; and hence we may find a slight dysphagia as the consequence of nose-disease.

Dysphagia

Apart from its influence over speech, obstruction in the nose influences intonation and pitch of voice to a considerable extent. I have on several occasions operated with the direct intention of improving the singing voice, and the result in every case has been satisfactory and in many very striking. Judging from these cases, the removal of post-nasal obstruction may raise the pitch of the voice, while enlarging the space in a stenosed nasal fossa often improves the *timbre*. But apart from this, the possession of perfect speech is of far more importance to the singer than is ever recognised.

Phonation

Physiognomy

Besides those mentioned, there are certain physiognomical points of some interest and importance in connection with nose disease. Broadly, it may be asserted as a fact that the thin prominent noses have a tendency to suffer from one or another form of obstruction; while the small, proportionately wide, and upturned nose is conducive to the consequences of abnormal patency. This is a point that will be enlarged upon in its proper place. Another peculiarity, interesting from the point of view of the mechanism of olfaction and nasal respiration, is the deep furrow running from the ala to the angle of the mouth, and sometimes seen in connection with obstruction of the middle meatus. This would appear to be caused by a constant action of the *levator labii superioris alæque nasi*, in its efforts to bring the nostrils on to a level with the inferior meatus, and thus facilitate nasal respiration. This fact is easily submitted to the simplest experiment. If, with an odoriferous substance beneath the nose we inhale its particles, first with the nostrils merely distended, and secondly with the alæ raised, we find that the olfactory region is far more stimulated in the former than in the latter case, the explanation being obvious. In the presence of a disagreeable odour we instinctively *turn up* the nose; while, when we wish to enjoy a sweet smell we dilate and even depress the alæ. In the former case, the air passes chiefly along the inferior meatus, while in the latter, it is directed more into the middle.

Olfaction

Olfaction itself is so purely subjective that its consideration is seldom of any value in the diagnosis of disease. Hence the olfactometers lately invented by Zwaardemaker, of Utrecht, have only a minor interest.[1] But it is noteworthy that in many cases where the sense of smell is lost, that of the taste of flavours, etc., is scarcely blunted. Such patients will occasionally observe that they can taste an odour through the nose though they cannot smell it. Such facts suggest the possibility of the posterior portions of the olfactory region being reserved for sources of stimulation communicated through the mouth, which are hence described as taste rather than smell; and further, that when these posterior regions are reached through the nose, the anterior parts of the sensitive region being destroyed by inflammation, etc., the sensation is still described in the same manner. As a matter of fact,

Taste and smell

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[1] *Brit. Med. Journ.*, December 1888, p. 1295.

the posterior parts of the nose are very rarely affected to the same extent as the anterior, and hence the sense of taste is but exceptionally seriously compromised.

Pharyngitis sicca, **A symptom of nose-disease**

One other symptom it will be well to discuss in this place, namely, the *pharyngitis sicca* of the text-books on throat-diseases, in which it is frequently treated as an affection *sui generis,* although it is invariably a symptom of nasal or naso-pharyngeal disease. In its mildest forms it consists of a film of inspissated mucus lying on the posterior pharyngeal wall, which may be wiped off with a pledget of cotton-wool, leaving the surface beneath in its normally moist condition. When in a slight degree such as this, it is caused in the majority of cases by some inability on the part of the nose to moisten the inspired air: this, impinging on the posterior naso-pharyngeal wall, abstracts aqueous vapour from a surface not adapted for providing a sufficient supply to keep it moist against such a demand. This milder form most often results from collapse of the erectile tissue lining the inferior meatus. In severer cases of *pharyngitis sicca* we find it generally associated with a *rhinitis sicca;* and as in the nose, so in the pharynx, we find it leading to a real atrophy of the mucous membrane with its glands, etc. In such we may see the muscular structure of the pharynx through its attenuated covering. Very rarely one finds an idiopathic *pharyngitis sicca,* in which no nasal disease can be discovered; but, as a general rule, the affection must be regarded as a symptom or concomitant of nasal disease. Moreover, it is invariably associated with more or less laryngotracheitis.

Nasal reflexes

Into the nasal reflexes it is not intended to inquire in this place. They embrace so wide a field that a chapter will need to be devoted to their consideration after the more common diseases have been passed in review.

CHAPTER III

ACUTE RHINITIS

Catarrhal, Dry, and Croupous Varieties

THERE is little to be said about the ordinary forms of acute rhinitis, as the symptoms, diagnosis, and treatment are a matter of everyday and personal experience to every one. But, as they are essentially affections of the nose, a treatise on diseases of this organ would be incomplete without some reference to the methods and manners assumed by inflammation, as it affects the mucous membrane of this region. There are three distinct varieties: (1) The catarrhal, (2) the dry, and (3) the croupous. It is not intended in this place to do more than refer to diseases in which the coryza affords the most prominent symptom, although, no doubt, the pathological condition is that of an acute rhinitis. Thus, in measles, influenza, etc., the rhinitis is but a symptom of the more serious infective disease; and the following description will apply as much to these, so far as the nasal symptoms are concerned, as to the affections in which they play the sole part.

Three varieties

Ætiology

The ætiology of acute inflammation in the nose is involved in the mystery that overhangs the whole process of taking cold in whatever part of the economy the symptoms are manifested. But apart from theory there are certain predisposing as well as exciting causes that are frequently overlooked in the causation of the affection. Among predisposing causes must be mentioned chronic rhinitis, and stenosis of the nose, whatever its origin. Struma, tubercle, and syphilis are the special *dyscrasiæ* that render the individual hypersensitive to sudden changes of temperature, exposure, etc. Anæmia does not appear of so much influence in this direction as one would suppose; but prolonged mental strain and debility from sexual excesses indubitably render the subject peculiarly susceptible to cold in the head. Physical fatigue, in like manner, is perhaps the most often responsible for placing the individual in the best condition for taking cold. This question of the overwrought nervous system in relation to the production of nasal catarrh is, doubtless, closely associated with the subject of hay fever and paroxysmal sneezing; and considerable space will be devoted to the point in discussing these affections.

Predisposing causes

Exciting causes

It is needless to pass in review the innumerable ways in which a patient ordinarily takes cold, such as draughts, wet feet, etc. But it is advisable to indicate that an acute rhinitis frequently arises from direct irritation of the mucous surface. This is most frequently seen after exposure to the London fogs, or less often from simple exposure to a bleak wind after sitting over a warm fire. Less often it is observed after the inhalations of irritating fumes such as chlorine gas, the various acids, bichromate of potash, etc. In patients suffering from certain idiosyncrasies, ipecacuanha, iodine vapour, pollen dust, etc., may induce the whole train of aggravated symptoms. But these idiosyncrasies are so frequently associated with chronic inflammatory conditions, the diagnosis and treatment of which are essential to the prophylaxis, that they will be deferred until the discussion of the nasal neuroses. It is after exposure to some powerful local irritant that the croupous form of inflammation is usually encountered, though some cases of ordinary acute rhinitis have lately been related in which the inflammation distinctly took the croupous form.[1]

Symptoms

(1) The symptoms are all briefly related. There are no rigors, the onset beginning with a mere feeling of chilliness and aching in the limbs, slight elevation of temperature, and general malaise. After a very short interval a stiffness, itching, and pricking in the nose are experienced; the eyes feel dry and uncomfortable, and there is a soreness which the patient refers to the back of the nose. After a few hours there is a thin watery discharge from the nose which gives no relief to the distress. As yet the organ has felt perhaps unusually and uncomfortably free for respiration; but now begins the sneezing and turgescence of the erectile tissue, which give to the attack its peculiar misery. The discharge grows more profuse and acrid, so that the nose and lips become sore and swollen. As the swelling and obstruction increase, the sneezing diminishes and the discharge becomes more tenacious, and later, towards the termination of the attack, mucopurulent. Concomitantly with this change, it loses its acrid, irritating quality. As convalescence approaches, herpes sometimes makes its appearance on the lips and cheeks.

Duration

The usual duration of an attack to which rational attention has been paid is three to seven days, though frequently, through neglect, the muco-purulent discharge persists for many weeks. Olfaction is only affected in the most severe cases, when it may be absolutely abolished for some days. The taste naturally suffers to a corresponding extent.

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[1] "Membranous Rhinitis," by Dr. F. H. Potter (Buffalo), *Journ. of Laryngology and Rhinology*, March 1889.

"Croupous Rhinitis," by Greville Macdonald, M.D., *Archiv. of Otology*, vol. xx., No. 2, 1891.

Accessory cavities

If the frontal sinuses or the olfactory region are involved, as not infrequently happens in the more severe cases, there is fairly intense frontal headache or pain referred to the back of the eyes. When the patient complains of face-ache, there is a possibility of the maxillary sinus being involved. Similarly there may be epiphora, from swelling of the lining of the naso-lachrymal canal, or deafness and tinnitus, from implication of the Eustachian tube. A certain amount of pharyngitis is often complained of, while there may be rheumatism of the muscles of the neck and jaws.

Rhinitis in infants

In infants, where the nasal passages are peculiarly narrow, a very slight rhinitis will entail considerable disturbance from the interference with respiration; for these patients invariably adopt nose-breathing, and even when it appears that the mouth is open, the tongue is nevertheless closely approximated to the roof of the mouth. Under such circumstances the child may be attacked with severe dyspnœa, but only during sleep. From the parents' accounts of these fits, as they call them, it would appear that laryngismus is sometimes induced. Anyhow, so strong is the instinct of nasal respiration in the child that nasal obstruction may be responsible for more infantile ailments than is usually supposed; and, now that the attention of the profession is being conspicuously directed to diseases of the nose, it is to be hoped that some more definite information on these points will shortly be forthcoming.

Instinct of nose-breathing strong in infants

While referring to the affection as seen in children, Gonorrhœal infection

it may be well to recall the fact that new-born infants sometimes suffer from a purulent discharge from the nose, usually supposed to be the result of gonorrhœal infection. There are a few cases on record where a similar condition traceable to the same cause has been developed in the adult. Such cases are presumably attended with superficial ulceration of the mucous membrane.

Objective symptoms

Objectively, there is nothing to be seen beyond, in the early stages, a little dryness of the septum and inferior spongy body, and, in the later, intense swelling of the erectile tissue, with obliteration of the inferior meatus. The colour of the mucous membrane is intensely red and sometimes dusky, though seldom so dark as in chronic rhinitis. The post-nasal space presents a similar appearance, though the dry stage may persist longer. The posterior wall of the nasopharynx sometimes presents a granular aspect, which may pass downwards into the pharynx proper.

Dry rhinitis

(2) In those forms of rhinitis where the dryness of the initial stage persists, although the stage of turgescence of the erectile tissue is attained in due order, the chief complaint is usually one of diffused headache, which may be very intense. Pain is especially complained of across the bridge of the nose and at the back of the eyes, from which it radiates over the whole occiput. The sneezing is very slight, and there is little or no secretion from the nose. Olfaction and taste are sometimes quite abolished. The patient may even complain that his nose will not run as it usually does when he has taken cold. That these rare cases are actually due to an acute inflammation of the nose is evidenced by the fact that the patients are distinctly aware of having been exposed to the

Its special features

weather, and that they have the usual symptom of malaise, etc., while the attack responds to such simple remedies as naturally suggest themselves. Objectively the most prominent feature is the swelling of the middle turbinated, which appears dry and glazed. The inferior turbinated is not so conspicuously swollen as in the usual form, while its surface also is dry, though not so prominently as that of the middle.

Pathology

The pathology of the ordinary forms of acute rhinitis does not differ from that of inflammation of the mucous membrane of other organs. In the dry variety there is probably more infiltration into the tissues themselves of inflammatory products and less exudation from the surface.

Treatment

Local applications

The treatment is most successfully conducted on such general principles as every household is acquainted with. Sometimes in certain individuals an attack may be curtailed with a full dose of quinine or by salicine, etc. In most cases local treatment is of signal service. The inhalation of benzoin of the pharmacopœia (Form. IX.), used with the usual precautions, gives the greatest relief. Along with this, hot fomentations applied to the forehead and nose are of considerable assistance. The latter are of especial value in the relief of pain in the dry form. Of other local remedies Ferrier's snuff is occasionally greatly praised (Form. XII.) It, as well as all nasal insufflations, is best applied through Bryant's auto-insufflator (Fig. 17); while other individuals find more relief from the use of Hager-Brand's remedy, composed of ammonia, carbolic acid, and spirit of wine. The efficacy of the latter

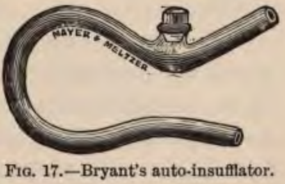

FIG. 17.—Bryant's auto-insufflator.

may be enhanced by the substitution of spirit of camphor for the alcohol (Form. XVII.) Sir Morell Mackenzie speaks highly of the specific effect of opium in cutting short acute catarrh. In preference to a full dose of Dover's powder at bedtime, as usually exhibited, he advises the administration of small doses of laudanum during the day. Remedies of great domestic reputation are full doses of camphor frequently repeated, and drop-doses of tincture of aconite, administered every hour. Diaphoretics, diuretics, etc., are doubtless of value in severe attacks. Nitrate of potash, with *spiritus ætheris nitrosi* and *liquor ammoniæ acetatis*, is a favourite combination. This, taken at bedtime with a basin of gruel, or with hot gin-and-water, will often arrest a cold at its commencement. But probably the most effectual of all such remedies is the vapour-bath, especially if used in the bedroom, as can be easily managed with one or other of the portable appliances now made. Abstention from fluids is said to be very effectual; but to most patients the remedy would appear as great an evil as the disease.

General remedies

In infants

With infants the difficulty of sucking with the nose obstructed is so great, that it may be necessary to take the child from the breast and feed it with a spoon. Mackenzie states that a small tube inserted into the nose will sometimes enable the child to suck easily.

Croupous rhinitis

(3) That a croupous form of inflammation should attack the mucous membrane of the nose, as well as that of the bronchial tubes or the larynx, can be a matter of no surprise to the pathologist, although as a clinical fact it has only very recently attracted the attention of experts. Even apart from the analogous condition

occasionally found in the bronchial tubes, if not in the larynx, it might almost be expected by the rhinologist, seeing that he often actually induces, although inadvertently, the precise condition. This may occur subsequently to the application of the electric or other caustic to the rhinal mucosa, when, on the day following the application, large masses of false membrane, firm, though transparent and finely fibrous, may be found extending for wide distances from the spot actually cauterised, sometimes almost blocking up the fossæ. As the cauterised surface is approached, the false membrane becomes firmer and more closely adherent, until over the slough itself it resembles the false membrane of diphtheria, in that it cannot be removed without a certain amount of force and the production of hæmorrhage. Here one cannot but recall the observations of Senator on the relation of croupous to diphtheritic membranes, the difference between the two, according to him, consisting merely in the different intensity of the inflammatory process in the two cases, whatever may be the initial cause of the inflammatory action. He says: "There is never any sharp boundary line between these processes; and in particular it is in many, indeed in most, cases quite impossible to say where the fibrinous superficial exudation, the croup membrane, ceases, and the pseudo-membranous slough, the diphtheritis, begins."[1] He then proceeds to draw an analogy between this condition of affairs and that encountered in the inflammation produced on the skin by the actual cautery: "Where the action has been most energetic you find a slough; beyond that an exudation in the

Inflammatory membrane

Senator

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[1] *German Clinical Lectures,* 2d Series, New Syd. Soc., 1887. Art. "Synanche Contagiosa," p. 415 *et seq.*

form of a bladder or vesicles, consisting of pus corpuscles and an albuminous material, which coagulates on exposure to air on opening the vesicles, and which is therefore fibrine," etc. He then accounts for the different appearances in inflammation of the skin and of the mucous membrane by the difference in anatomical structure; but, had he ever witnessed the changes following the application of the actual cautery to the mucous membrane of the nose, the correctness of his analogy would have been even more forcibly presented to him. In fact, the exudation produced after the application of the electric cautery and that formed in the course of an attack of croupous rhinitis are identical both in microscopical and macroscopical appearances. Consequently, seeing that the possibility of these cases being diphtheritic may be excluded, we are justified in assuming that the croupous exudation, sometimes occurring as the result of an acute rhinitis, is but an expression of the greater intensity of the inflammatory action, occasioned by ordinary cold-taking in certain individuals peculiarly predisposed to such a development. So much may suffice for a definition of croupous or, as it is sometimes called, pseudo-membranous rhinitis.

Croupous membrane simply inflammatory

There does not appear to be any special constitutional factor in the development of the affection. We find it in the anæmic and the full-blooded equally with the neurotic. All that can be affirmed as to ætiology is that one attack predisposes to another; from which it would appear that idiosyncrasy is largely responsible for the peculiar manifestation of the inflammatory attack. Probably climatic circumstances contribute to the ætiological factors, since the disease appears to be more frequent in America than

Ætiology

in Europe. Nor is this surprising when one remembers the greater prevalence in the former continent of all forms of nasal inflammation.

All observers appear to be perfectly satisfied that croupous rhinitis is quite unassociated with diphtheria, although certain authorities have described cases as occurring during epidemics of the latter. But such cases must obviously be excluded, as they should be described rather as nasal diphtheria. Clinically the membrane differs in its objective appearances from the diphtheritic in that it is usually not adherent, and may be removed without producing any hæmorrhage or abrasion of the surface. Moreover, the mucous membrane, so far as my observation of six cases instructs me, may be, though greatly swollen, rather paler than the colour of health; it may have, in fact, a somewhat œdematous appearance. This croupous inflammation of the nasal mucosa not uncommonly results, as has already been remarked, artificially, subsequent to electric or other cauterisation of different regions of the nose; sometimes extending over wide areas, the limits being at considerable distance from the site of the application. This fact seems to indicate that the membranous production is the result of an unusually intense inflammatory action.

Objective examination

In the idiopathic croupous rhinitis the extent of the patch may vary from the size of a small pea or even smaller, to such a size that the whole of the nasal and naso-pharyngeal mucous membrane is covered with a thick, gelatinous but firm membrane, which may be withdrawn from the nose with forceps and without the production of any hæmorrhage. On the posterior wall of the pharynx may be seen round or lenticular isolated patches lying on an unnaturally

Extent of membrane

pale base. These, though more adherent than the membrane in the nasal fossæ, can be peeled off with a brush or pledget of cotton-wool, leaving a surface somewhat heightened in colour, and occasionally slightly hæmorrhagic. Indeed there appears to be no pathological reason why in the same case the membrane should not be merely croupous in part of its extent, though here and there adhering close enough to involve some superficial sloughing; in which event it necessarily resembles very closely a diphtheritic membrane. Sometimes the affection is confined to the pharynx and naso-pharynx. In one of two such cases observed by myself the disease lasted ten weeks, without any elevation of temperature or other disturbance of health, the only complaint being of slight soreness. In this case the patches were regenerated from day to day after removal, while they indicated no tendency to involve other regions, or even to extend their own dimensions. Cocaine appears to have neither anæsthetic effect nor power of contracting the swollen turbinated bodies in these cases—a fact noted by other observers. This anomaly I have often noticed in cases of sharp inflammation following the electric cautery or other operation.

Relation of patch to mucous membrane

Cocaine

Subjective symptoms

The subjective symptoms are usually those of an ordinarily severe rhinitis, the temperature being raised to 100° or 101°. There is more or less occlusion of the nose, with a profuse flow of watery mucus, pieces of membrane being occasionally extruded on blowing the nose. In some cases, especially perhaps where the production of membrane is not great, there is severe paroxysmal sneezing, which may sometimes be allayed on the removal with forceps of a small portion of false membrane. After the removal of any portion of the false membrane, there is a strong tendency to its regeneration. Patients who have once had an attack appear in some cases predisposed to another, while in others there is a certain chronicity in the course of the symptoms. To the latter point Dr. Potter, of Buffalo, has referred.[1] In one of my cases there appeared at each attack, the patient having had a great number, a wide patch of erythema extending across the bridge of the nose. I may here mention that Schuler has noticed the association of a membranous rhinitis with facial erysipelas.[2] The duration of the affection, as will be gathered from the preceding remarks, is very variable. Potter, who has recorded the largest number of cases, gives the average as three weeks. But occasionally, as already remarked, cases run a chronic course. **Duration**

As far as treatment is concerned, there is little to suggest beyond such remedies as are likely to be of service in an ordinary case of acute rhinitis. Hot fomentations to the nose and eyes have appeared to be of special service, while irrigations of weak solutions of borax have a soothing effect. The membranes, if extensive, should be removed as fast as they accumulate; and in cases where they are so large that they cannot be extruded by blowing the nose, they should be removed with forceps. **Treatment**

Potter mentions the various remedies he has employed, but concludes his remarks on treatment by asserting that he does not think that by any means the duration of the affection can be shortened. Nevertheless he has found great relief experienced by the introduction into the nasal fossæ of dry tampons of cotton-wool. These, absorbing the excessive mucus, swell, and, by their pressure on the erectile tissue, effect that reduction in size which cocaine is unable to accomplish. "Often a series of pellets was introduced one after another, each being left *in situ* for five minutes or more; and this plan seemed to work very well" (*loc. cit.*)

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[1] *Journ. of Laryng.*, March 1889.

[2] *Jahrbuch für Kinderh.*, 1871.

The literature of the subject is not extensive, many of the cases recorded as pseudo-membranous rhinitis being obviously instances of diphtheria of the nose. The best account has been given by Potter, of Buffalo, to whose paper on the subject ample reference has already been made. But in certain respects his account differs from that given above, so far in fact as he asserts that the membrane cannot be removed without leaving a bleeding surface. Whether this be so or not in any particular case depends, in all probability, on the intensity of the inflammatory action. Glück[1] has also recorded some cases, Raulin[2] has reported four cases of Moure, and Chapin[3] has given us a good *résumé* of the subject.

[1] Glück, *Med. Record*, April 1889.

[2] *Revue de Laryngologie*, March 1890.

[3] *New York Med. Jour.*, 1890.

CHAPTER IV

CHRONIC RHINITIS—CLASSIFICATION

1. With Vascular Tumefaction of the Erectile Tissue. 2. With Vascular Collapse of the Erectile Tissue. 3. With True Hypertrophy of the Erectile Tissue.

THE study of chronic rhinitis embraces all the nasal affections commonly met with; for the latter are either developments of inflammation or direct consequences of it. That it should pass through phases unknown in other regions of the economy is accounted for by the peculiarly exposed situation of the nasal mucous membrane, as well as probably by the special physical conditions referred to in the first chapter. These last also account in great measure for remoter consequences that cannot be considered as developments of the inflammatory process.

Not only for convenience of description, but also as a means of grasping at once the relation in which the various developments of chronic rhinitis stand to one another, we may arrange our subject in the following tabular form:—

A. *Catarrhal Rhinitis.*

Classification

1. As affecting the erectile tissue—
   (i) Catarrhal rhinitis with vascular tumefaction

of the erectile tissue, sometimes erroneously styled hypertrophic.
(ii) Catarrhal rhinitis with vascular collapse of the erectile tissue. This is not infrequently mistaken for atrophic rhinitis.
(iii) Catarrhal rhinitis with true hypertrophy and œdema of the erectile tissue.

2. As affecting the ethmoid bone—
   (i) Hyperplasia of the middle turbinated body.
   (ii) Caries and exfoliation of the bone, accompanied by suppuration, which latter may extend to the accessory cavities.
   (iii) Mucous polypus and cysts, as a consequence and concomitant of (i) and (ii).

B. *Dry Rhinitis.*

(i) With simple mucous secretion.
(ii) With muco-purulent secretion. This is commonly called Ozæna. In its later stages it is correctly styled Atrophic Rhinitis.

Precise value of the classification

This classification it must be clearly understood is simply intended as a help to the study of the varieties of rhinitis. Although it is based upon broad scientific facts, yet there are often no hard-and-fast lines of distinction to be drawn. Thus we have often the middle and inferior turbinated bodies affected together: the former may be hypertrophied, while the latter is collapsed. This condition again may be observed either in catarrhal or dry rhinitis, and so on. But if the main points in the classification are borne in mind, they will obviate the danger of falling into some grave errors that are constantly being perpetrated.

Subjective symptoms The fewest words as to subjective symptoms will suffice in this place. They are altogether of small importance and of little or no diagnostic value. They point to the fact of nose-disease, but suggest little more in the way of diagnosis. Enumerating them in the order of their relative importance, buccal respiration will take the first place. This generally goes hand in hand with snoring, inability to blow the nose, and the typical buccal speech. Such are found with nasal obstruction. The closed mouth and fœtid breath; inspissated mucus hawked from the throat more often than blown from the nose; and the speech approximating that of the cleft-palate patient, are associated with the reverse condition, viz. abnormal patency of the nasal fossæ. The character of the discharge, apart from its degree of inspissation, whether mucous or muco-purulent, is of little value; but, when purulent or unilateral, it may be of considerable importance, especially as suggesting grave disease of the ethmoidal cells, or empyema of the maxillary, frontal, or sphenoidal sinuses. **Pus and muco-pus** The distinction between pus and muco-pus presents no real difficulty, though the difference is seldom realised: muco-pus is always transparent, tenacious, and ropy; whereas pus, however thin, is opaque, and however thick, is insusceptible of being drawn out into strings. Both, nevertheless, may present a bright canary-yellow. The secretion, especially in children after some of the exanthemata, may be thin and acrid, when it is liable to produce irritation of the nostrils and upper lip. Pain is of no very great importance except very occasionally. **Cough** Cough is occasionally a prominent symptom in obstructive disease, and apart from concomitant laryngitis. The nasal cough is dry and barking, such as is frequently excited

Olfaction

in passing a Eustachian catheter. The olfactory function too is of small moment as a diagnostic, seeing that very insignificant and imperceptible causes may result in considerable interference with its performance. Indeed, in a region so fully exposed to examination as the nose, the objective appearances are the only symptoms of much value. Occasionally it may be necessary in the text to enlarge upon the subjective symptoms.

We now proceed to the discussion of the diseases comprised under the heading of Catarrhal Rhinitis.

(1) As affecting the erectile tissue.

Vascular tumefaction

(i) Vascular tumefaction of the erectile tissue covering the inferior spongy bone, the floor of the nose, and extending for a certain distance on to the septum, so that the inferior meatus is lined with this vascular membrane, is the persistence of an occasional physiological condition. The function of this spongy venous tissue, it will be remembered, is to swell on exposure to dry cold especially, so as to present a larger area to the inspired air. More than this, in all probability it must be regarded as the great secreting organ of the nose. Nevertheless, great divergences in the size of the inferior turbinated bodies are sometimes encountered as the result of a chronic inflammation. Thus after exposure to the irritation of a London fog we frequently see the erectile tissue collapsed; or again, in an atmosphere oppressively moist and warm we find the tissue presenting an abnormal degree of turgescence. This tumefaction, like the reverse condition to be next described, may become persistent, leading to serious inconvenience, and even to actual disease from the nasal stenosis induced.

Ætiology

Sufficient has been said to make it plain that ordinary inflammatory conditions are responsible for this

Predisposing causes

Exciting causes

form of stenosis. The increased arterial blood-supply not only fills the venous sinuses, but communicates enough pressure to the blood in them to overcome the elasticity of the tissue, and thus induces its turgescence. Among predisposing causes, an important one appears to be an unusual narrowness of the bony framework of the nasal fossæ. In this state a very slight increase in the prominence of the erectile tissue will be sufficient to lower the air-tension in nasal inspiration to such a degree as will cause an additional overfilling of the venous sinuses. We find this tendency to simple chronic rhinitis with vascular obstruction particularly common in individuals with large prominent noses; hence it is very frequently observed among Hebrews, and thus we can readily account for the peculiar intonation ascribed to that race. Beyond such anatomical peculiarities the exciting causes are such as are generally productive of chronic inflammation, a moist atmosphere, sudden changes of temperature, or frequent subacute attacks. Of special local irritants the inhalation of fine dust appears to be often responsible for a chronic catarrh. Masons working in stone and marble are said to suffer but seldom from this source of irritation; possibly the particles are too heavy to float in the atmosphere. On the contrary, the dust of alabaster appears to be highly pernicious. This fact is, I am informed, commonly experienced by sculptors.

Objective symptoms

On examining the nose with a Thudichum's speculum, we find the field almost entirely filled with the swollen inferior turbinated body, which, together with the like-conditioned floor and septum, completely obliterates the inferior meatus as well as encroaches seriously upon the middle. Tilting the head well back we may generally obtain a view of the anterior enlargement of the middle spongy body (Fig. 29). The normal appearance is well illustrated in Fig. 1 of the frontispiece.

The points which distinguish this tumefaction of the inferior turbinated from other morbid conditions of obstruction are these: The prominent surface is smooth, uniform, globular; the colour is dark rose, sometimes purplish, though rarely, in anæmic conditions of the system, pinkish-gray. On examining it with a probe, we find it pits very easily, the impression being immediately obliterated; it fluctuates as if, indeed, it were a sac but half filled with its fluid contents. This impression on probing is quite pathognomonic. If we desire further verification, we may apply to the mucous membrane a 4 or 5 per cent solution of cocaine. This produces in a very few seconds a shrinking, and ultimately a complete collapse of the erectile tissue, so that the condition resembles that to be next described as the second variety of chronic catarrhal rhinitis. In determining exactly whether or no the inferior turbinated is too much engorged, it must be remembered that frequently in cases of deflected septum we find the erectile tissue unusually large on the side of the concavity. In such cases it must not be considered as necessarily pathological, except in so far as it is compensatory to a pathological condition entailing an abnormal width of the fossa on the side in question.

Cocaine in diagnosis

Concomitant conditions

As concomitant conditions we frequently have a catarrhal, sometimes hypertrophic inflammation of the naso-pharynx, the pharynx, and larynx. The tonsils in children are sometimes enlarged, and we often find post-nasal adenoids. Within the nose itself we may have every condition and stage of chronic inflammation of the various structures. Particularly must be mentioned enlargement of the anterior extremity of the middle turbinated, and hypertrophies of the septum, cartilaginous and osseous. In children, when the catarrh is very profuse, as sometimes occurs after measles, scarlet fever, etc., it appears to possess irritating properties, like an otorrhœa, and to induce an eczema of the alæ and upper lip.

Diagnosis

The diagnosis presents no real difficulty. The dark colour, the smooth globular and moist surface without any sign of translucency, render the appearance unlike any other. Where a tendency to lobulation or œdema exists, the condition is that of incipient hypertrophy.

Prognosis

The prognosis is good so far as the patient is willing to submit to the necessary treatment. There is apparently little tendency to spontaneous cure; but, on the contrary, we have clinical evidence of the advance of the disease towards true hypertrophy. The prognosis is the more favourable in those cases where there is a narrowing of the spaces from hypertrophy of the septum, provided this can be remedied. Apart from such conditions, there is more prospect of cure in cases where the muco-purulent discharge is not excessive.

Treatment

The treatment of this curious affection is simple in the extreme. In recent cases, especially where we have in conjunction a muco-purulent naso-pharyngeal catarrh, it may be sufficient to prescribe a simple detergent hand-wash for the nose, such as the *lotio alkalina* (see Form. I.) If the patient is unable to sniff it up from the hand, some being apparently unable to perform this simple act, it may be run into the nose by the help of Politzer's vessel for the

Cleansing

purpose; or it may be sprayed into the nose, though this is hardly as effectual unless a high pressure of thirty or forty pounds is available. Some patients prefer to syringe it into the nose, in which case it should be directed along the inferior meatus, with the nozzle of the instrument pointing obliquely downwards. In any case it is essential that the fluid be insufflated into the throat. At first it may produce a tendency to vomiting; but this difficulty is soon surmounted. The nasal douche is objectionable for many reasons, more especially because the high pressure entails considerable risk of the fluid entering the Eustachian tube.

Nasal douche objectionable

Medicaments

Very weak astringents, such as half, one, or two grains of alum to the ounce, applied through an atomiser, will sometimes effect a cure; or, on the contrary, in children we may paint the anterior extremity of the swollen inferior turbinated body with a strong astringent, such as glycerine of tannin, as recommended by Dr. Ringer,[1] once in the twenty-four hours, with great benefit. It appears to be specially valuable where the discharge is profuse and mucopurulent. The nasal bougies of the Throat Hospital Pharmacopœia are sometimes serviceable. They dissolve slowly in the nasal cavities and bathe the mucous membrane with the drugs contained in them. Those of acetate of lead, morphia, or of bismuth are particularly serviceable (Formæ. XXII., XXIII., and XXIV.)

If a watery running from the nose is the most troublesome symptom, it may be relieved by inhalations of creasote or cubebs (Formæ. X. and XI.), weak astringent sprays, or morphia *buginaria*. In some cases, especially when sneezing causes much distress,

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[1] *Handbook of Therapeutics*, ninth edition, p. 345

I have found chromic acid ($\frac{1}{4}$ or $\frac{1}{8}$ grain to the ounce) very serviceable as a spray (Form. VI.) Sprays are best employed warm, for five minutes three or four times a day.

Bougies

Where the vascular tumefaction persists in spite of such applications, we may sometimes gain something by the daily passage along the inferior meatus of a soft-rubber bougie. The patient may be taught how to apply it himself. The largest size that can be comfortably passed should be retained for five minutes or so, and then a larger one substituted, and so on till the passage is comfortably free. But more often the relief lasts at best for only a few hours after removal of the instrument; and after many weeks' treatment the improvement is scarcely noticeable. It should be remembered in using these instruments that the normal width of the fossæ varies much in different individuals.

Electric and chemical cautery

Finally, in the way of radical cure, we may have recourse to linear cauterisation of the swollen tissues with the galvano-cautery, or to a limited use of chemical caustics. If we desire to contract the tissue filling the concavity of the inferior turbinated bone, we may pass over the swollen surface a probe tightly covered with absorbent wool saturated with a small quantity of chromic, monochlor-acetic, or nitric acids. The first of these appears to cause the least pain, while the monochlor-acetic acid has the advantage of forming a slough which is retained until cicatrisation is completed beneath it, thus obviating the danger of adhesion should opposite sides be inadvertently touched with the reagent. Superfluous acid should be immediately removed by a piece of wool wrapped round a second probe. But a preferable manner of applying caustic for such purposes is by means of Woakes's caustic-carrier. It consists of a platinum probe flattened at its extremity and carrying a capillary slit, which retains a drop of acid until it is brought in contact with the surface to be cauterised. Or we may fuse chromic acid on to a probe by plunging the latter, heated nearly to redness, into the crystals.

In employing the electric cautery a simple wire burner is to be preferred to any guarded instrument, as it allows more perfect vision. It should be heated to a cherry-red. If too hot it is apt to produce hæmorrhage, and if of only a black heat, it may be decidedly painful. The current is best generated by an accumulator with rheostat, as sold by Coxeter; or, in the case of those seldom using it, by Schall's Voltolini-battery. Some authorities recommend plunging the incandescent wire deeply into the swollen tissue and holding it there for some seconds. I have not found this method nearly so satisfactory as the linear superficial cauterisation, while it is generally painful even where the cocaine has produced complete surface-anæsthesia.

Batteries

Superficial and deep cauterising

The beneficial effect, moreover, is slower to appear in the deep method of cauterising, while there is sometimes pain for a day or two after the operation. On the other hand, the linear method of cauterisation, especially when the electric current is employed, is so highly satisfactory that we may invariably employ it in the absence of subacute inflammation and a profuse discharge. When the affection is accompanied by either of the two last conditions, we shall probably be disappointed with the cautery until they have been subdued by other measures.

Cocaine

Before employing any cautery measures, a 5 or 10 per cent solution of cocaine should be sprayed over the surface freely, when, after the lapse of two or three minutes, the surface will be sufficiently anæsthetised. In children the drug must be employed very cautiously. One or two unrecorded deaths have, I believe, occurred from its careless exhibition.

In certain cases, apparently favourable to the cauterising method of treatment, we fail altogether in securing any improvement, objective or subjective. Such appear to contradict the theory of American authorities, who explain the benefit accruing from the electric cautery by assuming that cicatricial tissue is formed which binds down the mucous membrane to the periosteum and bone. In these obstinate cases I have on two occasions achieved much good from depletion of the swollen bodies, as first suggested and employed with good results by Dr. W. H. Daly of Pittsburg, U.S.A.[1] He has found it specially serviceable in the treatment of cases refusing surgical measures; for by wrapping cotton wool round a small knife it may be employed under the pretence of cleaning the nose; while, if the latter is first cocainised, the patient will not feel the incision. Ordinarily a small tenotomy knife should be plunged deeply into the swollen tissue, preferably not cocainised, the incision being enlarged as the instrument is withdrawn. Hæmorrhage is pretty profuse, and may be encouraged by bathing the nose externally with warm water. The process may need frequent repetition.

Depletion

The general health, of course, must be carefully attended to. The patients are sometimes gouty, sometimes anæmic, sometimes syphilitic, and must be treated accordingly. Some authorities, especially those in America, strongly recommend the internal administration of cubebs, which may be used in one or other of the formulæ given in the Appendix (Formæ. XXV. to XXVII.)

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[1] "On Some Mild Measures in the Treatment of Intra-nasal Hypertrophies and Inflammations," *Med. and Surg. Reporter*, 17th November 1888.

Collapse of the erectile tissue

(ii) Vascular Collapse of the Erectile Tissue. In most cases where, the middle turbinated body being normal in size and the olfactory fissure not unnaturally wide, we can obtain through the anterior nares a view of the posterior wall of the naso-pharyngeal cavity, we may conclude that the erectile tissue is in a greater or less degree of collapse. This may be temporary or permanent. In the latter case, the condition is productive of various symptoms, the result of the imperfect moistening of the inspired air. We find, for instance, a tendency to *pharyngitis sicca*: the posterior wall of the naso-pharynx, being the first moist surface upon which the dry air impinges, gives up its water and becomes coated with a film of inspissated mucus. Indeed, this condition of the nose is found in most cases where the posterior wall is dry. Special emphasis must be laid upon the fact that we never find the nose and pharynx thus affected without more or less laryngitis: a point that will be further developed when we consider *rhinitis sicca.*

Sometimes a symptom of anæmia

This collapse of the erectile tissue may be a symptom of either catarrhal or dry rhinitis, subacute or chronic. We perceive sometimes, after direct exposure to irritative agents, especially a yellow fog, supersaturated though it is with aqueous vapour, a tendency to dryness of the mucous membrane. Yet although this condition of collapse is found as a symptom of such various affections, it is, when once developed, little given to variation in degree, and little susceptible of treatment. Indeed, it generally presents itself concomitantly as a symptom of general anæmia, especially in women suffering from menstrual disturbance; in which case it is obvious that little can be effected by local treatment, so long as the constitutional condition is neglected.

Sometimes, on the contrary, we find this collapse of the erectile tissue in individuals who are decidedly full-blooded and good livers. These may be possibly gouty, though I have seen no positive evidence of such an association. Such subjects are perhaps even more prone than the anæmic to suffer from pharyngeal and laryngeal inflammation; and it is for these symptoms that relief is generally sought, the patients being quite unaware that the nose is disordered, unless indeed there is pain, as not infrequently happens, across the bridge of the nose. The latter occurs when there is some inflammation of the middle turbinated.

Sometimes in gouty subjects

See p. 100

On making a rhinoscopic examination, the observer is first struck by the great length of the middle turbinated bone brought into view, the anterior third or so of which presents a dry, glazed, and rather swollen aspect. The inferior turbinated body is collapsed to such a degree that it is frequently described as atrophied. But if we examine the inferior turbinated bone in the skull, we see that, allowing for the soft parts, no more projects into the choana than is observed in such cases. Moreover, as soon as this collapsed erectile tissue has regained its normal degree of turgescence under appropriate treatment, the impropriety of applying the term atrophy to this condition becomes sufficiently apparent. It is occasionally assumed that this atrophy is a later stage of the so-called hypertrophy; in other words, of the vascular turges-

Objective symptoms

Not to be confused with atrophy

cence of the erectile tissue. But as a matter of fact there is absolutely no clinical or pathological reason for the assumption. The entire distinction of the two affections may be conveniently represented in the following tabular form:—

Table

	VASCULAR TUMEFACTION OF THE ERECTILE TISSUE.	VASCULAR COLLAPSE OF THE ERECTILE TISSUE.
(i)	Occurs chiefly in men.	Chiefly in women.
(ii)	In all habits of body.	Chiefly in anæmia.
(iii)	Accompanied by a mucous or muco-purulent catarrh.	Strong tendency ultimately to a dryness of the mucous membrane.
(iv)	Causes catarrhal laryngitis and pharyngitis with post-nasal catarrh.	Causes pharyngitis and laryngitis sicca.
(v)	Tends to grow worse and advance to true hypertrophy.	Tends to spontaneous cure if the constitutional disabilities are ameliorated.

See Chap. VIII.

So much for clinical fact; the pathological differences will be referred to in discussing the second form of dry rhinitis, viz. ozæna.

Concomitant conditions

The only concomitant condition in the nose is inflammation of the middle turbinated, the frequent presence of which is our principal justification for considering this collapse of the erectile tissue an expression of chronic rhinitis. To specify, we often find an inflammatory state of the mucous membrane covering the middle turbinated, and even an actual hypertrophy, such as will be immediately described. This perhaps may be considered a further reason for refusing the term atrophic to this affection.

Prognosis

The prognosis is good so far as the transition into dryness has not advanced to any extent, and so far as there is no marked hyperplasia. But even in bad cases the symptoms, if not very severe, are easily ameliorated. It must especially be noted that there is no tendency whatever for these cases to degenerate into ozæna, unless perhaps in such contingencies as will be related in discussing the latter disease. The diagnosis presents no difficulty whatever, but will be reverted to in the account of dry rhinitis. See p. 158

Treatment The treatment, as has been indicated, consists essentially in building up the constitution and paying the strictest attention to hygienic rules. The menstrual functions no less than the digestive must be regulated, and the mind lightened of worry. I remember a bad case that for over a twelvemonth had resisted all methods of treatment, yet underwent spontaneous recovery when the patient became engaged to be married. So in the nose, as elsewhere, mental impressions are sometimes powerful therapeutic agents. Such an influence may account for the improvement often observed with change of air. **Change of air** One patient living in town fills out her spongy bodies when she goes to the sea, another living on the coast finds the same advantage from going a little way inland. Where there is much tendency to dryness, considerable relief will be experienced by using some stimulating wash, such as the Lotio Alkalina (Form. I.), or the Chloride of Sodium wash (Form. II.) Sometimes sea-water diluted with half or equal parts of warm water is more beneficial than any similar solution compounded in the laboratory.

Again, especially when the larynx is not appreciably suffering, considerable relief may be experienced, and objective improvement secured, by plugging the nostrils **Plugging the nares** with cotton-wool for as many hours together as the patient will bear it. Thus rest is given to the membrane, and desiccation of the mucus prevented, to which, in this affection, there is always a strong tendency. But the treatment is never lightly tolerated; and so strong is the instinct of nasal respiration, that very few patients can support an artificial obstruction in the nose, although they soon learn to accept mouth-breathing when forced to it by disease. A similar method of treatment will be discussed under the head of *Rhinitis Sicca.*

Principle of treatment

The principle of treatment here involved is clearly the reverse of that advocated for the relief of vascular turgescence. Instead of irritating the surface, and so inducing contraction of the arterioles and collapse of the venous sinuses, we aim at giving complete rest to the mucous surface and removing vaso-motor irritation. As will be seen in discussing *rhinitis sicca,* the inspissated mucus itself appears to act as an irritant and to induce collapse of the erectile tissue. However, the whole question of irritation of this spongy structure is a difficult one; and the above remarks must be taken for their clinical value rather than for their theoretical physiology.

True hypertrophy

(iii) The next subject is catarrhal rhinitis with true hypertrophy of the erectile tissue. This condition involves chiefly the inferior turbinated body, though rarely it affects the floor and septum to such a degree that we hear it described as polypus of those regions,—a mistake not inexcusable, considering the sometimes close resemblance which this hypertrophied erectile tissue bears to the inflammatory neoplasms, designated by common consent as polypus.

Ætiology

Ætiologically, the condition is probably due to a persistent condition of engorgement of the erectile tissue, as in the less serious cases we always find it associated with the latter. It is most frequently found in the nose with the narrow fossæ, these occurring, for the most part, where the member is of the Hebrew character. Like polypus of the nose, the affection is sometimes distinctly hereditary; while the only history deducible is that of a succession of attacks of cold in the head, the affection apparently only reaching the stage of hypertrophy after many years' duration. It is found chiefly in men of all ages, though the older they are the more severe, as a rule, is the hypertrophy and its symptoms; yet some very severe cases are occasionally met with in young adults of both sexes, associated with post-nasal growths.

Symptoms

In a well-marked case of the hypertrophy under discussion we have all the symptoms of chronic rhinitis greatly aggravated. The obstruction, though still liable to a certain amount of variation, is more severe, and sometimes is complete and invariable; moreover, it is highly sensitive to changes in the hygrometric condition of the atmosphere. The discharge is generally profuse, sometimes very tenacious and slightly purulent, while naturally there may be considerable sneezing, conjunctival irritation, etc., with the usual catarrhal condition of the pharynx and larynx, the consequence of the nasal obstruction. Cough is occasionally a troublesome symptom, not only from the concomitant laryngo-tracheitis, but as the result of reflex irritation in the nose. Though the palate is often paretic, the voice retains the characteristic quality of nasal obstruction.

Objective

On making an examination of the anterior nares, we are first struck with the quantity of ropy mucus obscuring the structures from view. If the patient be unable to blow through his nose, it may be necessary to spray it out with an alkaline wash or cleanse it with little mops of cotton wool on probes. Then we perceive in the most severe cases a pale, œdematous mass, obscuring the normal structures, and, at first inspection, bearing a strong resemblance to ordinary mucous polypus. On closer investigation, however, it will be seen that the mass is distinctly, sometimes finely and deeply, lobulated, having perhaps a cauliflower-like appearance (see Fig. 18). Examination with a probe reveals this arrangement more satisfactorily. With this assistance, moreover, we learn that it is in all probability attached to the margin and body of the inferior turbinated; or if not, as rarely happens, then to the lower portion of the septum, or to the floor of the nose. But wherever situated, it is freely movable upon its attachment, although it can scarcely be described as pedunculated. It is never seen connected with the middle spongy body, or descending from the superior meatus. When assuming the cauliflower appearance it usually involves the whole length of the inferior turbinated body, filling the inferior meatus, and closely packed into the concavity of the bone; so that after we have apparently cleared the passage by operative measures, we may still turn out of this recess large quantities of the hypertrophic growth. More rarely these growths are rounded and solitary, assuming almost a pedunculated aspect; or there is a finely lobulated fringe attached to the lower margin.

Fine lobulation

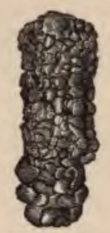

FIG. 18.—Exact size and appearance of portion of hypertrophied inferior turbinated after removal with the cold snare.

But in hypertrophy it is not invariable that the anterior portions assume the pale cauliflower appearance described. They may be pinkish or rose coloured, and very coarsely lobulated. In such cases there is usually some vascular engorgement of the sinuses in

Coarse lobulation

addition to the actual hypertrophy. In this case the probe reveals a marked tendency to pitting, while cocaine will induce a partial shrinking. By this means the relative amount of hypertrophy and turgescence will be precisely indicated. Indeed, without this assistance, it may be difficult to determine the right methods to be pursued for treatment. The transition between the two states is sometimes but ill-defined; yet it may be asserted that whenever there is the slightest appearance of lobulation, however ill-defined, we must consider it as hypertrophic, and act accordingly.

View of posterior nares

On examining the posterior nares, the same sort of growth may be seen covering the inferior turbinated, projecting into the post-nasal space, and even weighing heavily on the soft palate, causing it to assume, more conspicuously than in any other affection, the perpendicular position (see Figs. 19 and 20).

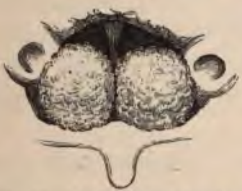

FIG. 19.—Post-rhinoscopic view of great enlargement of inferior turbinated bodies, the middle being concealed.

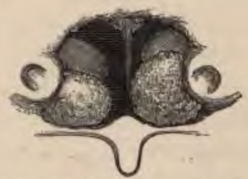

FIG. 20.—Post-rhinoscopic view of slight enlargement of inferior turbinated bodies with congestion and swelling of middle.

Nevertheless, there is this difference in the appearances as seen from before and behind: posteriorly the hypertrophy, having more room for its increase in size, has far less tendency to minute lobulation, and may even, though rarely, *appear* perfectly smooth. In this case, if œdematous, it may in its aspect be indistinguishable from polypus; or, when pink or pale rose colour, from the smooth variety of post-nasal adenoid growths. Perhaps it is upon the strength of such cases as these, and when the turbinated hypertrophy is associated with adenoids, that certain authorities assert that these growths may spring from the septum, etc. As a further variety, the projecting portion may be smooth circumferentially, but finely lobulated in its central, most prominent region.

Occasionally the growth in a backward direction is so enormous that it completely fills the post-nasal space. In this contingency it is only with the help of a digital examination that the point of origin of the growth or growths can be satisfactorily determined, and the diagnosis from adenoids or polypus be accurately established.

Digital examination

Sometimes, when the posterior enlargement owes its increase in size chiefly to œdema, and is yet sufficiently pronounced to be readily recognised with the post-nasal mirror, so soft and yielding is its structure that we are unable to detect it with the finger. This is a point to be borne in mind when attempting to remove it with the snare.

Mulberry-like hypertrophy

Rarely the hypertrophied posterior ends are of a dusky rose-colour, almost purple indeed, and distinctly granular or evenly lobulated. They project to a considerable degree, and may attain the size of a small walnut. When as large as this, they overlap the septum, and may meet one another, thus causing considerable obstruction. The appearance has been correctly likened to that of a ripe mulberry. They are usually symmetrical in size and contour, and give to the finger an impression of considerable substance. In this, as in other respects, they differ considerably from the soft œdematous enlargements.

Concomitant affections

The most frequent concomitant affections, besides those so often attendant upon all forms of nasal obstruction, are hypertrophies and deflections of the septum, enlargement of the middle turbinated, and, in young adults, hypertrophy of the post-nasal adenoid tissue and pharyngeal tonsil.

Pathology

The pathology of this hypertrophy is simple enough if we consider it as the result mainly of simple hypernutrition of pre-existing elements. If, on the other hand, we regard it solely as the consequence of inflammatory action, we are struck with its exceedingly complex nature. For we have overgrowth of the venous sinuses to a conspicuous extent, especially in the less lobulated varieties, of all the connective tissue elements, and of the lymphoid tissue; the only point in which these differ from the normal being more or less separation of the elements by an œdematous exudation. It is more particularly in the finely lobulated kinds that the œdema is so conspicuous. In different cases one or other tissue predominates in quantity. The cauliflower variety is conspicuous for the large quantity of small-celled growth embedded in a fine reticulum of connective tissue; whereas, in the smoother, darker, and less lobulated kinds, particularly those which project into the naso-pharynx, we find a general hypertrophy of all the elements,—erectile, connective, and adenoid tissues, and even of the mucous glands. Where the lymphoid tissue bears the more important share in the hypertrophy, it yet does not justify the supposition of similarity in origin with post-nasal growths, as Dr. Woakes assumes;[1] for these cases but rarely occur in conjunction with post-nasal vegetations, enlarged tonsils, etc. Indeed, hypertrophy

Histology

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[1] *Post-Nasal Catarrh*, 1884, p. 169.

of the inferior turbinated is seldom or never observed in children, though not infrequently in male adolescents and young men. Consequently, where we find the lymphoid tissue augmented, it is probably the result of a localised hypertrophy. Moreover, I have several times observed cases where the extreme varieties of hypertrophy, the pale cauliflower, and the darker, coarsely lobulated, coexisted on the same side.

Hence one is apparently justified in assuming that there is a common local condition provocative of each variety. The probable cause of the increased arterial supply which leads to hypertrophy has already been fully discussed in Chapter I. There it was concluded that the starting-point in most cases of hypertrophy is a chronic rhinitis with vascular engorgement of the erectile tissue. Consequently, although the hypertrophy is not the immediate consequence of the inflammatory action, we are justified in discussing it under the head of Chronic Rhinitis. And in the long run, what with the initial rhinitis and the subsequent self-induced irritation from mutual friction, there is small doubt that some inflammatory products help to swell the bulk of the hypertrophied mass.

See p. 18 *et seq.*

Origin of increased blood-supply

Why the hypertrophied mass should assume a dendritic arrangement is not so easy to determine. But it is interesting to remember that this is one of the forms adopted by nature for increasing the area of a secreting surface, viz. by a process of *protrusion* instead of *inversion* as commonly observed. Instances of the former occur in the Haversian fringes of the synovial membranes, in the urinary organ of the snail, and perhaps in the choroid plexuses in the brain.

Diagnosis

The diagnosis of the affection presents no difficulty if the preceding description be considered. From polypus we distinguish it by the lobulation and firmer attachment, as well as by the region from which it springs. Only when a polypus possesses a papillomatous surface do we see any departure from its usual smoothness; but in this case it presents a villous rather than a cauliflower aspect. In tubercular disease of the nose the proliferating granulations might possibly be mistaken for hypertrophy of the erectile tissue; but the purulent secretion in the former, with the friable and hæmorrhagic nature of the obstructing growth, ought to leave no room for a doubtful diagnosis.

Prognosis

The prognosis is decidedly good if the patient is willing to submit to surgical treatment, but otherwise bad; for there is apparently no tendency towards spontaneous cure or amelioration. I have seen the nose packed with the growth in a Hebrew gentleman of seventy-five, who stated that his nose had been obstructed all his life; yet even in this case there was no difficulty in effecting a cure, the symptom for which he sought relief being a continual reflex cough. This disappeared with the nasal obstruction.

Treatment

The only satisfactory methods of treating this hypertrophy are surgical, although in less pronounced cases, where there is much vascular engorgement, something may be effected by cauterising the surface in the manner described in the treatment of vascular tumefaction. The means almost universally adopted is the snare, either cold or incandescent. For the smaller and less vascular growths, and perhaps for all but the largest, the cold wire is preferable. Of the various instruments used for this purpose, Jarvis's is probably the safest (Fig. 21). To him is due the credit of first operating upon the nose in this manner.

Jarvis's snare

The special points of superiority in his instrument are the slowness with which the loop can be tightened and the strength of the instrument. A modification of this instrument (Fig. 22) I have devised, the additional merits being a handle with which it can be firmly held without obstructing the field of vision, and a collar from which radiate four spokes, which, one by one, can be turned with the thumb of the same hand, and the screw thus withdrawn with its attached wire. Thus the left hand is free for holding the speculum or insertion into the naso-pharynx. Mackenzie's snare (Fig. 35) has these requirements, but works too rapidly for the vascular growths under consideration.

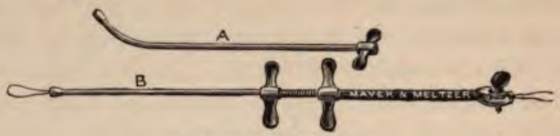

Fig. 21.—Jarvis's snare.

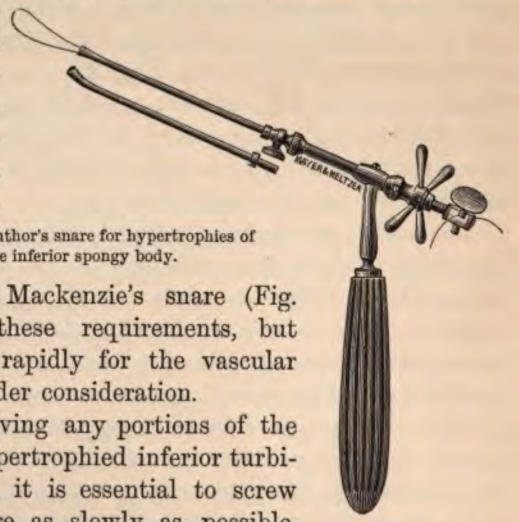

Fig. 22.—Author's snare for hypertrophies of the inferior spongy body.

In removing any portions of the vascular hypertrophied inferior turbinated body, it is essential to screw up the wire as slowly as possible, in order to seal effectually the severed vessels. With the larger portions, at least fifteen or twenty minutes

Risk of hæmorrhage

Incandescent snare

should be occupied in the process. But even with this precaution, there is occasionally sharp and troublesome hæmorrhage after removing large pieces, especially those extending from the posterior extremity. For these one may prefer the incandescent snare, in spite of the objection that it induces considerable inflammation in the neighbourhood from the generation of steam, etc., and that cicatrisation is consequently somewhat delayed. But against its employment I ought to remark that on one occasion I had some secondary hæmorrhage. The handiest instrument for this purpose, owing to the facility with which the wire can be alternately heated and tightened, is Sattler-Nieder's (Fig. 23). It is equally applicable for the cautery burners. The risk of hæmorrhage condemns the ring-knife with which Mr. Spencer Watson cuts off these excrescences.[1] Generally, it is easier to remove the posterior hypertrophies, as well as the anterior, with cocaine rather than under a general anæsthetic. When the former is used, owing to the paretic condition of the soft palate

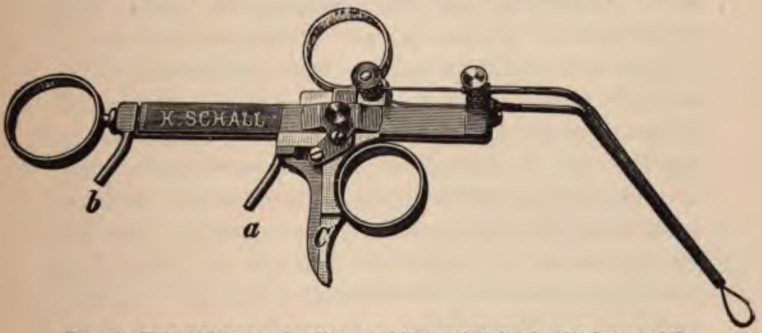

Fig. 23.—Universal cautery handle; *a* and *b* are points for the attachment of the connecting cords; C is the trigger for completing the circuit.

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[1] "Remarks on the Removal of the Inferior Turbinated Body, with Cases," *Med. Press and Circ.*, December 1888.

Operation with post-rhinal mirror

in this affection, the post-rhinal mirror will usually enable us to hitch the snare, passed through the anterior nares, over the neoplasm—a proceeding in every respect easier in skilled hands than fixing the noose with the forefinger in the naso-pharynx. Exceptionally a palate-hook may be of some assistance, in which case White's is most useful, as it is self-retaining (Fig. 15). The hypertrophy, especially when highly œdematous, may be so soft and yielding, as has already been mentioned, that the finger is incompetent to realise its presence; and it is for this reason that eyesight will guide the instrument better than finger-touch. When œdema and vascular engorgement are alone responsible for the swelling, the snare may altogether fail in removing any portion of the body.

Antiseptic dressings

For two or three days after the operation the wounds must be kept clean with insufflations of iodoform or iodol, after washing with solutions of antiseptics, such as boroglyceride or boracic acid; while the usual precautions against hæmorrhage, such as eschewing hot drinks and violent exercise, and any circumstances or habits which might tend to induce vaso-motor paresis of the vessels of the head, must be enjoined. The cauliflower excrescences are far less prone to hæmorrhage than the larger and smoother kinds projecting into the naso-pharynx. The former, when small, may occasionally be satisfactorily destroyed with the incandescent knife or wire.

CHAPTER V

ON THE PATHOLOGY OF CHRONIC INFLAMMATION AS WITNESSED IN THE MUCO-PERIOSTEUM OF THE NOSE

Structure of Mucous Polypi—Caries and Suppuration—Osseous Cysts and Abscess

In the consideration of diseases involving the middle spongy bone, we find ourselves in quite a different pathological region. For here we are dealing with the unmistakable products of inflammatory action, the share of which in the ætiology of some diseases, considered in the last chapter, was to a certain extent problematical. So that now we find it more correct to speak of hyperplasia rather than of hypertrophy.

Hyperplasia and hypertrophy

Seeing that inflammation is the process by which all ordinary affections involving the middle spongy bone are produced, it will not be inopportune to discuss the pathology of connective tissue and osseous inflammation, investigating the while any special conditions which may render the processes in any way different from similar changes occurring in other regions.

Anatomical points of importance

In the first place, it is necessary to recall certain anatomical facts concerning the normal tissues. The pituitary mucous membrane is highly vascular, especially towards the free margin and extremities of the middle turbinated bone. It contains a certain amount of erectile tissue, but not enough, apparently, to modify materially pathological changes; indeed, it frequently seems to disappear completely with the encroachments of inflammatory elements. The mucous membrane possesses a large number of racemose and tubular glands, the openings of which are visible to the naked eye when examined in the post-mortem room; and sometimes, in an inflamed condition, they give a granular appearance to the membrane during life. The connective tissue, but little elastic, is inseparably united with the subjacent periosteum, which can scarcely be said to form a distinct structure. The bone itself is minutely and closely perforated with foramina, for the passage of arterial twigs from one surface to the other—a fact probably of considerable importance, as will be presently seen.

Importance of foramina

Muco-periosteum

This intimate connection of mucous membrane with periosteum makes it impossible, in all probability, for one layer to be inflamed without the other participating in the change. When also we recall the exposed position of the structure under consideration—continually meeting cold air, arresting atmospheric impurities, mechanical, biological, and chemical, with which it is laden, and not perpetually swept clean, as is the conjunctiva by the eyelids, the likelihood of its frequent inflammation must be admitted. But, however intense the inflammation of the muco-periosteum may be—and sometimes it is sufficient to excite the severest pain—it is very rarely, in attacks of simple inflammation, followed by necrosis. This is possibly owing to the anatomical reason just mentioned: that the upper and protected surface is never attacked as severely as the lower, and contributes through the anastomosing foramina to the nutrition of the under surface. In syphilitic disease we probably may have both surfaces simultaneously involved, although necrosis of the turbinated bodies is not very frequent. But, except in this disease, substantial necrosis is a rare event, notwithstanding certain statements to the contrary.

Pathology

The minute pathological processes of chronic rhinitis as affecting the muco-periosteum are simple enough. The connective tissue, in consequence of prolonged irritation and arterial stagnation, becomes infiltrated with small round cells, while the fibrous elements swell and lose their toughness, or are dissolved and converted into a gelatinous intercellular substance. The blood-vessels increase in size and number, while the mucous glands also appear to enlarge, and possibly become more numerous. If the inflammatory process partially subside, the rudimentary tissue will assume a higher form of structure, and the serous infiltration disappear. The new cells partly elongate and form fibres, and partly are absorbed; in fact, we have remaining a condition of hyperplasia in which new tissue similar to the old is superadded between its layers.

Ostitis granulosa

But if the inflammatory process continue, the connective tissue of the muco-periosteum becomes wholly replaced by this new granulation tissue, which may invade even the Haversian canals. Then follows the gradual absorption of bone-salts, bone-tissue, and corpuscles by this new growth, and we have a superficial *ostitis granulosa*;[1] while, if we thrust a probe between the mass of granulations, it impinges on carious bone. The conversion of connective tissue of periosteum and Haversian canals into granulation-tissue may ultimately cause partial or complete absorption of the delicate middle spongy bone—a condition with which we occasionally meet, and that without necessarily the formation of pus. As will be supposed, this *ostitis granulosa* is not the only form of caries attacking the structures under discussion; we may have, as in bone everywhere, a *caries suppurativa*, generally confined to small circumscribed areas, and associated with the free formation of pus, as well as other evidences of inflammatory action, such as large œdematous granulations. The latter may resemble entirely, even in being covered by columnar, ciliated epithelium, some forms of ordinary mucous polypus. Nor is this a solitary instance; for the granulations connected with caries of the tympanum are also enclosed in a layer of ciliated epithelium—a fact the more remarkable, seeing that the neighbouring mucous membrane carries a squamous epithelium.

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[1] Billroth's *Surgery*, New Syd. Soc., 1878, vol. ii. p. 167.

Caries

Or again, the inflammatory action, instead of inducing absorption of bone-tissue, may result in the process known as osteophytic periostitis, whereby we have a steady increase in the diameter of the bone and a roughening of its surface (Fig. 24). The anterior third of the middle turbinated in dry specimens is frequently found in this condition towards its free margin; so that we should imagine the process to be very common. Indeed, clinically, we frequently find great increase in the size of this body, the augmentation in bulk often involving mainly the osseous elements. Examining such specimens microscopically, we perceive stalactitic laminæ of bone shooting into the hyperplastic connective tissue, and innocent, save here and there at their margins, of osteoclasts or Haversian

Osteophytic periostitis

canals (Fig. 24). An occasional giant-cell may be found; but such do not appear to be of much importance in the bone formation. This deposition of new bone perhaps belongs to the process called by Virchow *metaplasia*, where hyperplastic connective tissue may become either osseous or degenerate into mucoid tissue.

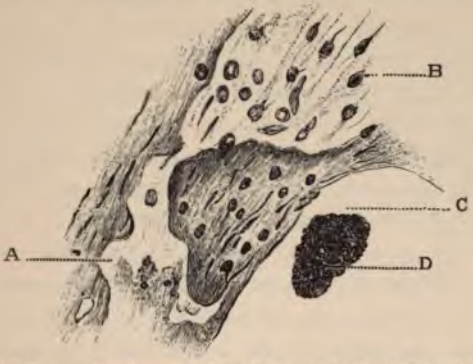

FIG. 24.—Unorganised deposit of bone in a case of osteophytic periostitis. A, new bone; B, bone-cells; C, venous sinus; D, blood-clot.

Occasionally, though happily rarely, cases occur where simple inflammatory action leads to the substantial necrosis of bone and the formation of sequestra. **Necrosis** The probe may discover unmistakable plates of dense bare bone, involving the middle turbinated or other portions of the ethmoid, and even the cribriform plate. Curiously, these sequestra appear to have small tendency to spontaneous separation.[1] It would appear that the border between living and dead tissues, instead of throwing a barrier of pus-forming granulation-tissue between the necrosed and healthy bone, and so causing the separation of the former, is continually dying itself, and thus extending the area of the sequestrum. Yet, in some situations, the separation may be impossible from the position of the sequestrum. Of course such cases are always accompanied by profuse suppuration, although, owing to the free drainage, there is little or no putrefactive odour. According to my observations fœtor is observed only in those cases where the pus, from its small quantity or its situation, becomes dried, or where it is retained in one or other of the accessory cavities. Cases of such necrosis have been observed and recorded by Durham,[1] Rouge of Lausanne,[2] E. Woakes;[3] and I have seen six myself. It is necessary to insist upon the obvious fact that necrosis is always accompanied by suppuration, seeing that "necrosing ethmoiditis" is asserted to be a disease exceedingly common among patients who have none of the usual symptoms of diseased bone in the nose (Woakes).

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[1] Mr. Watson Cheyne has suggested to me the probability of such cases being due to tuberculosis, seeing that one of the characteristics of this disease in bone is the delay in the separation of necrosed portions.

But before proceeding further, one or two other consequences of bone-inflammation, as seen in the middle turbinated, must be investigated. The first is the formation of abscess, and the second the development of cysts. **Abscess** Small abscesses in connection with periostitis and superficial ostitis probably occur more frequently than we see them clinically as such; for suppuration of the bone, as occasionally seen, may have originated in a subperiosteal abscess. Far rarer, however, than these are abscesses enclosed in thin, distended bony walls. Of this I have seen one unequivocal case. The tumour had the appearance of a greatly enlarged middle turbinated, causing considerable obstruction of the middle and encroaching upon the inferior meatus. Between it and the outer wall was oozing a creamy pus. On removing the projecting portion with the snare, a cavity was discovered shut in by thin shell-like walls and almost filled with red, fungating and œdematous granulations (see Case No. 17 in the synopsis of cases of Empyema of the Maxillary Sinus, p. 338). Subsequent observation proved that the pus had found its way from the abscess into the antrum, from which it gained an exit, as soon as the cavity was full, through the normal *ostium maxillare*. On the cavity discharging its contents, it would appear that it became filled with granulation-tissue, sprouting from the margin of the pathological opening into the antrum.

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[1] Holmes's *System of Surgery*, third edition, vol. ii. p. 642.

[2] *Nouvelle Méthode pour le traitement chirurgical de l'Ozène*, Lausanne, 1873.

[3] *Nasal Polypus*, etc., 1887.

Illustrative case

Osseous cysts are more common, though sufficiently rare to raise doubts in the minds of even the most experienced as to their real nature. Of cysts I have seen seven cases, although, so far as I am aware, the only reference to them to be found in literature are a case related by Dr. P. M'Bride to the Medico-Chirurgical Society of Edinburgh,[1] and a brief, though partly erroneous account of two cases in the first edition of this book. In the former reference bilateral osseous cysts were described as containing air, one of which was redistended after crushing with forceps; in the latter it was attempted to show that the development of such structures might be analogous to that of similar tumours of the long bones, a view which will be presently shown to have been hasty and incorrect. The pathological ætiology of cysts involving the middle turbinated is simple enough. The process in

Cysts

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[1] *Brit. Med. Journ.*, 1888, p. 1116.

all probability begins in an osteophytic periostitis, which, as we have seen, results in a general increase in the size of the bone in every diameter. The free margin of the bone being incurved upon itself, the extension inwards of this border, from the pathological process just mentioned, will bring it in contact, and ultimately in union, with the body of the bone. Thus a cavity may become enclosed and sealed at all points by a similar process occurring at the two extremities. Adhesions in various localities are by no means uncommon in the nose, and are fully exemplified in the further history of these cysts. Thus this bone-hypertrophy may result in the production of a cavity, lined with mucous membrane, and generating mucus, which from the lack of outlet gradually distends the cavity into which it is secreted. Hence are acquired the extreme thinness of the cyst-walls, and the enormous size sometimes attained, with adhesions to, and distortion of, neighbouring structures. Moreover, as an osteophytic periostitis is not infrequently associated with the development of mucous polypus, these cysts are often, perhaps generally, associated with polypi, which may be found studding the external surface of the tumour, or more or less completely filling the interior.

Pathology of cysts

That the above is the correct explanation of these curious developments is proved by microscopical examination of any portion of the cyst-wall. On each side of the thin lamina of bone is found a layer of mucous membrane covered with columnar epithelium: whether ciliated or not on the inner surface has not been satisfactorily determined. The outer layer of mucosa is normal in every respect, except in those situations where it has undergone polypoid metamorphosis. But

Cysts lined with mucous membrane

the inner layer, presumably from the pressure of the contained fluid, is for the most part devoid of mucous glands, which in the normal condition are abundant. The inner layer, moreover, indicates other noteworthy alterations. In one of my seven cases where the contents were atheromatous, the lining membrane was thrown into rugæ and mammillations, giving it a villous appearance and texture. Microscopical examination showed these excrescences to be composed of inflammatory products in various stages of development, but almost everywhere covered with columnar epithelium. They presented all the varieties of structure comprised in the ordinary tissue of mucous polypus. In one spot the excrescences would present solely accumulations of granulation-tissue, occasionally breaking through the epithelium, and doubtless giving birth to pus-cells as well as to fatty degeneration of the epithelial cells, the presence of which doubtless gave the atheromatous character to the contents; while in another, close at hand, the elevation beneath the epithelium might be seen to present the typical appearance of polypus; that is to say, a fine fibrous network with wide spaces enclosing sparsely scattered cells of an inflammatory origin, varying in size and shape. The breaking down of the epithelium and its substitution by granulation tissue may suggest that the case should be considered rather one of abscess than of cyst. But this surface-ulceration appeared to be exceptional rather than the rule; while, after washing out the cavity, only a small portion of the walls being removed to gain access to the interior, there was at no time any evidence of suppuration. Doubtless the cyst might readily have been converted into abscess, a contingency not infrequent with similar neoplasms in other regions; and

Microscopical characters

the rare cases of abscess of the middle turbinated possibly originate in a cyst produced by retained secretion.

Œdema the striking point in nose inflammation

But the most characteristic feature belonging to the process of chronic inflammation in the nose is the tendency of all new formations, whether hypertrophic or hyperplastic, to become œdematous. This is partly accounted for on physical grounds already discussed, viz. by the fact that, during nose-breathing with partial obstruction, the intra-vascular pressure exceeds that of the intra-nasal atmosphere during inspiration, and so produces a freer outflow from the vessels into the tissues.

Produced artificially

Definition of polypus

But besides this, there are other conditions which tend to hold the water in the connective tissue meshes. During complete nasal obstruction the water is not removed from the surface by evaporation, while the hyperplastic tissues themselves have a strong tendency to absorb moisture from without. Thus, if we place a portion of thickened mucous membrane or a mucous polypus in water for an hour or so, weighing them before and after, we find they have increased their weight perhaps as much as one-half (Fig. 25). We may consequently assume that the very fact of such structures being continually bathed in mucus assists their tendency to œdema by endosmosis from their surface. Indeed, cases frequently occur where it is impossible, on clinical or pathological grounds, to determine whether a structure shall be designated a portion of œdematous hyperplastic mucous membrane or a typical gelatinous polypus. Such considerations prepare one for the statement that mucous polypus of the nose is but an ordinary inflammatory production peculiarly modified by the physical conditions in which it exists. Microscopical examination as well as the ætiology of the disease endorses such a supposition.

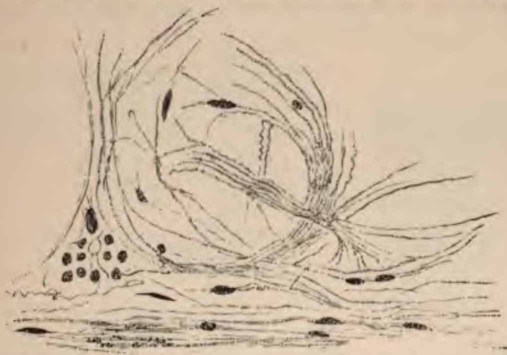

Fig. 25.—Section of hypertrophied mucous membrane after immersion in water for an hour, showing separation of elements by the aqueous infiltration.

If we investigate the minute anatomy of a portion of mucous membrane, the nature of which, as has been remarked, we are unable from microscopical appearances to assign definitely either to hyperplasia or polypus, we may find unmistakable evidence of both conditions. In some parts the tissue will be infiltrated with small round cells embedded in a fine reticulum like that of lymphoid tissue; in other situations we find spindle cells of various sizes, their extremities lengthening into fibres which intermingle with those of mucous spaces; more rarely we find a few cells bearing resemblance to the typical myxomatous cell; while immediately beneath the epithelium we may find the usual layers of hyperplastic connective tissue (see Figs. 26, 27, and 28).

Varieties in structure

In some cases polypi may be partly the result of the process termed by Virchow *metaplasia,* occurring in the hyperplastic tissue. According to this authority the fibres and fibrillæ disappear as the fibrous tissue

Metaplasia undergoes its transformation into mucous tissue. Or again, by a similar process, calcareous salts may be deposited in the ground substance, and the tissue be converted into bone.[1] In the case of hyperplastic rhinitis such changes may be held to occur simultaneously; for while the outer portions undergo partial liquefaction, in the neighbourhood of the periosteum we not infrequently find deposition of bone-salts.

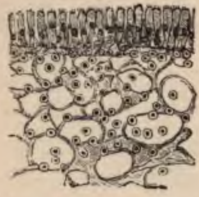

FIG. 26.—Reticulum and ciliated epithelium of polypus.

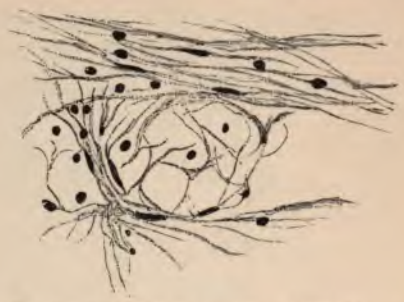

FIG. 27.—Polypus-tissue more resembling myxoma.

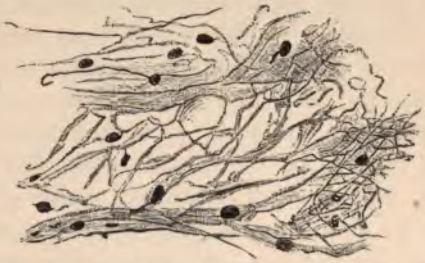

FIG. 28.—Œdematous connective tissue from elongated uvula.

So that it would appear that we have conclusive evidence in favour of regarding mucous polypi as inflammatory products rather than belonging to the myxomata, or adenomata, or sarcomata. And apart from the œdematous condition, which, as has been remarked, is largely due to the external conditions of the growths, the likeness between a young polypus projecting from a soft friable mass of inflamed mucous membrane and the so-called fungous granulation is remarkable. That the latter contains a quantity of well-formed mucous tissue has been pointed out by Rindfleisch, although perhaps it may be more properly compared to lymphoid tissue. But it is an accepted fact that irritated connective and other tissues not uncommonly yield mucin, which thus becomes a product of inflammation (Virchow).

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[1] *A Text-Book of Pathological Anatomy*, by E. Ziegler, translated by D. Macalister, 1883, part i. p. 131.

Resemblance of some polypi to granulation-tissue

When the polypus springs from a friable inflammatory swelling which consists largely of cellular elements, its growth is not unlike that of a fungating granulation. This is what probably occurs: a small point becomes more inflamed than the surrounding tissue, rises above its level, and in consequence perhaps of its diminished support—in consequence, that is to say, of the dissolution of its fibrous elements—absorbs the moisture in which it is bathed; it becomes pale and œdematous. Its vessels increase in size; for, instead of breaking down on the surface as would an exposed granulation, the embryonic tissue grows and becomes feebly organised, thus increasing the demand for nutrition. The granulation elements branch out or become spindle-shaped, developing, around the base and the blood-vessels, into fibres, as happens in the process of healing by granulation. The inflammatory neoplasm advances, absorbing mucus externally, pushing the mucous membrane before it—or if not this, at any rate the ciliated epithelium—until it has become a structure wholly apart from and independent of its

Pathological history of a polypus

parentage. The surrounding membrane from which it sprang may possibly, protected from further irritation by its swollen offspring, return to a healthy condition; but the polypus has now its own pedicle and system of vessels, and there is nothing to hinder its growth. It gains strength and independence by the conversion of its pedicle into fibrous tissue, from which bands ramify into its interior. In other words, the polypus tends to cicatrise at its base; but the cell-growth has, so to speak, gained the start, and proceeds on its way unchecked.

Polypi in acute rhinitis

Probably not a few polypi are developed in some such manner as above described during an attack of acute rhinitis. These are generally solitary pedunculated growths, and unassociated with a general hyperplasia of the surrounding mucous membrane. Of this sudden growth I have seen a solitary but unequivocal instance (see Case 7, p. 336). The patient, with a healthy middle turbinated, developed in seven days during an attack of acute rhinitis a polyp of the above description, attached to the anterior extremity of the middle turbinated. After removal and a single cauterisation it never recurred. It consisted of gelatinous tissue, with very few small round cells.

Proportion of glands

Most mucous polypi contain a certain number of mucous glands, tubular for the most part, and greatly enlarged both in calibre and the size of their epithelial linings. The proportion they bear to the surrounding tissue apparently varies according to the mode of preparing the specimens. If they are hardened in alcohol the spaces contract, the bulk of the growth diminishes, and the relative proportion of gland-tissue increases. To form a just estimate, sections must be made without any previous hardening.

These tubular glands may possibly be accounted for on the hypothesis of hyperplasia and œdematous swelling. The lobules of the racemose glands become stretched and elongated from swelling of the tissue in which they are embedded, and thus may come to resemble tubular glands. The actual numerical increase of the glands is somewhat problematical; and true adenoma, such as occurs in polypus of the rectum in children, is never, so far as my experience goes, found in the nose.

Histology in prognosis

But whatever the amount of gland-structure, the connective tissue of these polypi consists of granulation, spindle-celled, fibrous, or perhaps sometimes mucous tissue; in each case there being more or less infiltration with mucus. Billroth assures us that those polypi which consist chiefly of fibrous tissue are less prone to recurrence than those where spindle-shaped or round or mucous tissue-elements predominate. Hence microscopical examination may perhaps occasionally assist prognosis.

Papilloma of polypus

In polypi of many years' duration we occasionally, though rarely, find those portions most exposed to irritation, especially if protruding from the nostrils, covered with a thick layer of well-marked papillomatous tissue, which gives the surface a villous texture (Fig. 29). Yet the bulk of the neoplasm consists of the ordinary mucous-polypus elements, and cannot be considered different in its origin from other such formations. The hypertrophy of the epithelium is a mere accidental development from the irritation to which the surface is exposed.[1] Of the frequent occurrence of tumours of a sarcomatous or cancerous nature after the extirpation of simple mucous polypus, as stated to occur by Erichsen,[1] I have no knowledge, nor am I aware that other authorities have recorded similar observations.

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[1] The formation of papilloma upon a base of mucous polypus was first pointed out to me by Mr. Charters Symonds; since when I have met with three cases in which the phenomenon was pronounced.

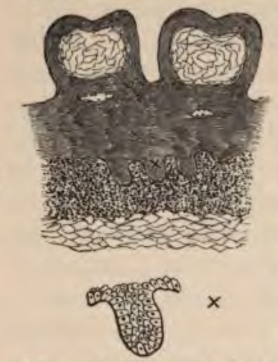

FIG. 29.—Papilloma on surface of large mucous polypus. Two papillæ with centres of œdematous connective tissue project from surface. Deeper the epithelial structure projects finger-like (×) into a small-celled inflammatory growth intervening between the papillomatous and polypus tissue.

Study of polypi of great interest

Polypi the products of inflammation

The whole question of the ætiology and pathology of these nasal neoplasms is fraught with great interest; for in the study of them one is brought into close contact with the borderland between inflammatory action and true neoplasms, independent in their growth of the structures in which they originated. In other words, we may be able to trace the steps by which inflammatory action leads to the formation of tissue which ultimately must be considered heterologous to that from which it primarily springs. From microscopical examination alone we should classify nasal polypi as granuloma, œdematous fibromata, myxo-sarcomata, adeno-sarcomata, and so on, according to the preponderance of the different elements. But from clinical observation and ætiological study, we cannot but consider them, one and all, as the products of inflammatory action.

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[1] *Science and Art of Surgery*, seventh edition, vol. ii. p. 395.

CHAPTER VI

CHRONIC RHINITIS AS AFFECTING THE ETHMOID BONE

1. Simple Hyperplasia of the Middle Turbinated. 2. Caries and Necrosis involving the Ethmoid Bone. 3. Cysts and abscess.

HAVING fully discussed the pathological consequences of neglected chronic inflammation as it affects the middle turbinated body, we now proceed to the enumeration of the clinical, diagnostic, and therapeutic points of the different diseases.

Hyperplasia of middle turbinated

1. Hyperplasia of the Middle Turbinated. The ætiology of this affection has already been sufficiently discussed from the pathological standpoint. Suffice it to say that the subjects are often anæmic women, and that when it first comes under observation it has generally persisted for many years. No definite cause can usually be assigned, though some patients have been much exposed to the inhalation of dust. Chimney-sweeps, bakers, furriers have numbered among my patients.

Symptoms

Simple enlargement of the middle turbinated bone seldom gives rise to any symptoms unless it is aggravated. Occasionally, however, the periostitis gives rise to pain somewhat severe, sometimes paroxysmal, though more often of a dull, aching character.

Usually it is referred to the bridge of the nose, less frequently to the brow, and very rarely to the parietal region. A complaint of mere tightness across the nasal bones is not uncommon in all forms of rhinitis, and is sometimes present without any objective signs of disease; it is then presumably vaso-motor or neurotic in its nature. Cases have been occasionally recorded where ocular disease has originated in middle turbinated enlargement as well as nasal polypus. The discharge is not often, except after sneezing attacks, very conspicuous; while nasal respiration is rarely interrupted, except occasionally by occlusion of the opposite side from pressure. Olfaction is nearly always more or less blunted on the side affected.

Tightness across nose

Objective symptoms

The objective symptoms are simple and characteristic. In severe cases there may be some widening of the bridge of the nose, the latter being sometimes pushed to the opposite side. The rhinoscopic examination reveals at once the middle turbinated enlargement (Fig. 30); for, generally speaking, the erectile tissue of the inferior turbinated is more or less collapsed, permitting a view of the posterior naso-pharyngeal wall. But while the inferior meatus thus appears to have an abnormal patency, the middle is more or less encroached upon by the enlarged middle turbinated bone, which may actually come into contact with the inferior. The mucous membrane covering the enlargement has a tendency to dryness rather than the reverse, unless it is studded with polypi; and the lower anterior portion, looking downwards and forwards, is frequently covered with a film or crust of mucus, in which are embedded the

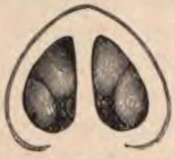

FIG. 30.—Enlargement of middle turbinated. The nasal fossæ are unusually wide.

atmospheric impurities. Thus in a miller we find the covering white, and in a chimney-sweep black. In fact, this portion of the middle turbinated would appear to be as much exposed as the inferior to the inspired current of air. The inferior, however, being a more fruitful secreting surface for the reasons cited in Chapter I., washes away the dust, etc., as fast as it gains a footing. Sometimes the overgrown middle spongy body presents an even rounded tumour, in which case new bone usually enters largely into its structure; while in other cases we may perceive a deeply congested, perhaps more or less œdematous flap depending from the free margin. In the latter case a probe will satisfy the observer as to its true nature. The probe also is of service in a rarer class of case, where a smooth or granular, rounded, dark-coloured tumour projects into the nose, and consists for the most part of granulation-tissue. It is soft and yielding, although but slightly movable, owing to its wide attachment to the bone above. The probe may sometimes be thrust through the softened mass deeply into the structure, when it is either arrested by what appears to be carious bone; or in some cases it may pass quite through the body, owing to the absorption of the bone structure by the granulation-tissue. Such are cases of *ostitis granulosa*.

Ostitis granulosa

Where this dry caries has destroyed the bone in spots, we may sometimes find considerable bony hyperplasia towards the free margin. But such cases are decidedly rare.

In severer cases we perceive the middle turbinated not only lying in contact with, but actually displacing the septum towards the opposite side, and thus tending to obliterate the other nasal fossa. The affection

Displacement of septum

indeed is as often unilateral as symmetrical. When bilateral, one side is usually more pronounced than the other. Sometimes we find on one side the bone and its mucous membrane in a state of hyperplasia; while on the other side it may be carious, or the hyperplastic connective tissue may have degenerated into polypus. This condition of hypertrophy may be associated with other conditions, *e.g.* suppuration of the ethmoidal cells, caries of other regions, and indeed with real atrophy both of portions of the middle turbinated as well as of the inferior. Such concomitant conditions, however, we shall have to discuss separately; they are seen for the most part in cases of old standing ozæna. Rarely the hyperplasia assumes the form of dense fibrous nodules attached to the bone, in which case they appear to be localised alterations of a generally enlarged middle turbinated.

Suppuration

Diagnosis

The only difficulty in diagnosis is the distinction between this condition of the middle turbinated and mucous polypus; but from what has already been said concerning the pathology of chronic inflammation, it will be perceived that the difference is one of degree only. As a matter of fact, we find hyperplasia frequently associated with unequivocal polypus. One other point in diagnosis it is necessary to mention. The proliferation of small round cells with the formation of a granular, smooth, or œdematous red growth attached to the free border of the middle turbinate and movable with the probe is occasionally seen in secondary syphilis, together with mucous patches in the pharynx. In tertiary syphilis, moreover, we sometimes find firm fibrous nodules attached to the turbinated bodies.

Prognosis

The prognosis of these cases depends much upon the concomitant conditions, and the subjective symptoms. Where the latter are due to pressure of the hypertrophied bodies, the results of operative measures are very satisfactory. When dryness of the mucous membrane is a prominent symptom the prognosis is necessarily grave. On the contrary, cases showing a tendency to the production of polypi may be regarded more favourably. Probably few cases have any tendency to spontaneous cure.

Treatment

The treatment is sometimes difficult and not always very satisfactory. In some cases, indeed, all surgical measures must be avoided. Where, for instance, the enlargement is causing no symptoms from pressure upon contiguous structures, but more especially where there is a tendency to, or actually, a dry mucous membrane, we should be cautious in interfering with what secreting power remains. With some specialists it is a common practice to remove large portions of the middle turbinated whenever it is but slightly enlarged; and I have on several occasions found the symptoms aggravated by the procedure. But where there is neuralgia or pressure upon the septum, where there are evidences of suppuration in the neighbourhood of the superior meatus, or where there are sneezing and catarrh or other reflexes from direct irritation on the part of the enlarged body, we must adopt summary measures for treatment.

Indications for operating

The most expeditious and satisfactory method of removing the enlargement is by means of Jarvis's, or the author's, snare employed by preference with the curved termination to the barrel (Figs. 21 and 22). The wide segment of the noose is hitched over the anterior extremity of the middle turbinated body and made to include the necessary portion. The wire is then tightened as rapidly as may be—seeing that, unlike our experience with the inferior hypertrophies, the operation is painful even with cocaine, while the hæmorrhage is not great—until the bone or hypertrophied mucous membrane is severed. Snares. Mackenzie's snare (Fig. 35) is scarcely powerful enough for bone work; but in the instrument of Jarvis, or any of its many modifications, such as Fig. 22, the leverage is sufficient to force the wire through any density of bone found on the middle turbinated. No. 5 piano-wire is stout enough for these purposes. In the more formidable operations where cocaine is not a sufficient anæsthetic, it is preferable to place the patient under a general anæsthetic. With a Leiter's incandescent electric light on the forehead we can operate as comfortably with the patient in the recumbent posture as when sitting upright.

Where the hypertrophy assumes the form of a fleshy flap hanging from the free margin, we may Cautery. prefer to destroy it with the electric or other cautery. By plunging the incandescent point deeply into the tissues and destroying them without injuring a large surface of mucous membrane, we may sometimes reduce the mass without much impairment of the secreting surface. But only too often this has long struck work.

In those cases where we find a mass of granulation-tissue, red and œdematous, perhaps granular, filling the concavity of the middle turbinated, we may wisely remove the inflammatory tissue with a Volkmann's Sharp spoons sharp spoon (Fig. 31). The advantages in such cases will possibly not be apparent to the patient; but the probability of such tissue degenerating into mucous polypus is sufficient reason for the procedure.

After-treatment.

After removal of a large portion of the middle turbinated there is generally some constitutional reaction, and the patient should be kept in bed for a day or two. The wound should be carefully washed twice a day with the alkaline lotion (see Form. I.) or boroglyceride; then, after dressing with iodoform or iodol, the nostril should be packed with antiseptic wool. Daily dressing should be enjoined until granulations may be presumed to cover the wound. Granulation-tissue springing from wounds in the nose is peculiarly liable to fungate, and will sometimes prevent the healing indefinitely. This point must be borne in mind, if only as a warning not to lose sight of a patient until cicatrisation is completed.

Medical treatment

Sometimes, when the pain across the bridge of the nose is severe, and it is apparently not produced by direct pressure of the swollen middle spongy bone, much relief may be afforded by hot fomentations to the nose and forehead, or by an ointment composed of oleate of mercury and morphia, applied to the bridge of the nose and over the frontal sinuses (Form. XIX.)

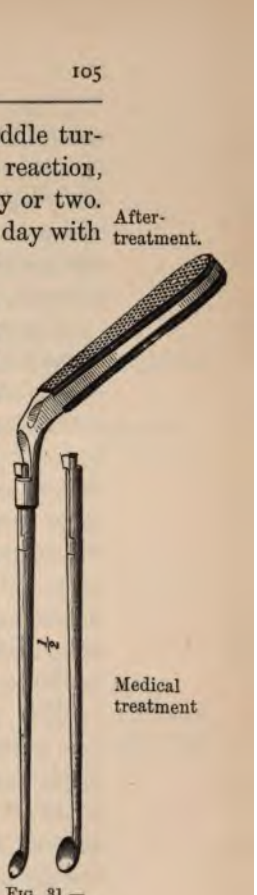

Fig. 31.—Mackenzie's sharp spoons.

Caries and suppuration

2. The next point to be discussed is a condition difficult in some cases to diagnose, and in all to treat scientifically or practically. It is that of caries of the middle turbinated; or, since the disease is seldom localised in that structure, we may say, disease or caries of the ethmoid bone. And not only are the ethmoidal cells likely to be involved, but frequently, perhaps generally, the antrum of Highmore is filled with pus and itself involved in the disease, either primarily from

extension outwards of the disease, or secondarily only to its being filled with pus generated elsewhere. Probably in no case can we have ethmoidal disease without suppuration, and the so-called "necrosing ethmoiditis" without such symptoms is presumably in every case an oversight.

Ætiology

There are no special points to be observed in speaking of the ætiology. A large number of cases are anæmic, but whether as a cause or consequence it is seldom easy to determine. Of one case only have I observed the onset. The patient had, a twelvemonth previously, suffered from a polypus in the other nasal fossa, which after removal had shown no tendency to recurrence. There was no rhinitis previously to the commencement of the purulent discharge; but the patient, a neurasthenic woman, was passing through a period of great mental anxiety.

Subjective symptoms

The symptoms are chiefly of a local character. The patient complains of a purulent or muco-purulent discharge from the nose, usually unilateral, and sometimes fœtid. This fœtor may or may not be apparent to the patient. The odour never assumes the intensity attained in ozæna; it is neither so penetrating nor so repulsive. The discharge is sometimes very profuse, necessitating the use of ten or twelve handkerchiefs a day, according to their size and patient's habits. When flowing from beneath the middle turbinated it finds its exit mostly through the anterior nares; but when coming from above it tends rather to run into the pharynx. Sometimes it contains caseous, stinking particles which the patient may describe as gray, putty-like, or gritty. They strongly resemble the offensive, cheesy masses extruded from the tonsillar follicles. The patient frequently suffers from various

Pus may contain caseous particles

neuralgic symptoms referred to the same side of the head. There is occasionally tenderness on percussing the nasal bones or over the frontal sinus. The pain may be paroxysmal. Altogether in many respects the symptoms closely resemble those of empyema of the maxillary sinus, with which the disease under discussion is closely associated, and the diagnosis from which is sometimes a matter of considerable difficulty.

Objective symptoms

Objectively the observer is first struck with the large neoplasm filling the middle meatus, the shining granulation mass being more or less covered with yellow, opaque, half-dried pus. This must not be confounded with the transparent, yellow muco-pus of a simple chronic rhinitis. On wiping away the pus with a mop of cotton wool we may, on exerting a little pressure, see it welling out either from above the inflammatory neoplasm or from the concavity of the bone, or lastly, from what appears to be a cleft in the midst of the structure. This last condition has been incorrectly described as a cleavage of the middle turbinated. As a matter of fact, we here have two distinct structures lying closely in contact, from between which the pus is oozing. The upper one is indeed the middle turbinated, but the lower is an inflammatory outgrowth from the outer wall, apparently arising from the neighbourhood of the unciform process, either above or below the *ostium maxillare*. This formation sometimes consists of dense bone, the result of an osteophytic periostitis, though it may be covered with œdematous granulation-tissue like that of the bone beneath which it lies. That it is a production of the outer wall and not part of the middle turbinated is shown by the fact that there is no passage for a probe between it and the outer wall; while above it the instrument can be

See p. 59

See p. 177

Osteophytic growth from outer wall

passed into the concavity of the middle turbinated and up into the infundibulum. A similar condition is met with in simple cases of empyema of the antrum, and occasionally in ozæna or dry muco-purulent rhinitis. In the former case it is probably the sole remaining evidence of previous bone-disease in the nose, which preceded the implication of the antrum. Not uncommonly the granulation-tissue becomes more œdematous, and the blood-vessels thereby sufficiently attenuated for the structure to lose its colour and become translucent. Such a case would be diagnosed as simple polypus, the point of distinction being the presence of suppuration. Like simple hyperplasia of the middle turbinated, these suppurative cases may be, from similar causes, associated with any degree of deflection of the septum. In exceptional cases we may see a few small polypi attached to the middle turbinated bone. On examining the diseased structures with the probe we are often unable to reach exposed bone, owing to the quantity of granulation-tissue springing up in the immediate neighbourhood. But, by carefully searching, our instrument before long is sure to impinge upon bare bone. We should not use a fine probe, because with such the soft muco-periosteum is easily raised and an impression of bare bone conveyed. A straight stout probe, on the contrary, can hardly lead to such a mistake. When the pus flows from above the middle turbinated the probe is often of no assistance. As with simple enlargement, we very seldom find any implication of the structures brought into view with the post-rhinal mirror.

Distinction between polypus and granulation-tissue

In long-standing cases it must be admitted that the probe impinges upon what any out-patient dresser would declare to be unequivocally a sequestrum—a bare plate of bone, along the rough surface of which a probe may be passed. This may be felt either on the middle turbinated, or, after the destruction of this by molecular necrosis, on the cribriform plate. Yet, although I can recall six of such cases, in none has any necrosed bone separated spontaneously; in none has there been any fœtor after evacuation of the antrum, except in the occasional fœtid and caseous particles referred to; and in none have the small particles of bone, removed occasionally with the masses of granulation-tissue, been discoloured or foul-smelling. So that the point is in need of further elucidation. **Necrosis** Cf. p. 88

While bearing in mind, as its essential point in the affection under discussion, the concomitant suppuration, there should be no difficulty in diagnosis. In ozæna we have the abnormal width of the nasal fossæ, the bilateral symmetry, the collapse of the erectile tissue, the more complete inspissation of the secretion, and the quite pathognomonic stench, any of which points distinguishes it from suppuration and caries. From simple polypus or hyperplasia we distinguish it by the presence of pus; and from muco-purulent rhinitis by the opacity of the purulent secretion, however thin it may be. In syphilitic disease with necrosis, again, we are assailed by a fœtor which is met with only under like conditions in the nose or elsewhere; by the necrosed portions involving generally the septum and hard palate, or, if elsewhere, by the sequestra being discovered with the probe; and lastly, by the fact that no amount of cleansing of the nose will materially alter the offensive odour. **Diagnosis** **Syphilis**

The treatment is a matter of serious difficulty, requiring great patience on the part of the surgeon no less than on that of the patient; but given this requisite, it is in the large majority of cases fairly **Prognosis**

Probable tendency towards spontaneous cure

satisfactory. Probably there is a tendency towards spontaneous recovery after a certain amount of destruction has taken place. At any rate cases are occasionally observed where large portions of the middle turbinated bone have been destroyed, in which there is no present suppuration, though such is said to have existed.

Treatment on ordinary principles

Interpreting correctly the nature of the disease, the treatment must be conducted on purely scientific principles. Free drainage must be ensured; fungating granulations, be they red and fleshy or pale and gelatinous, must be destroyed; and lastly, healing must be rendered possible by keeping the wound aseptic. In providing for the first requirement it must be ascertained that the antrum is not filled with pus. Should this be the case the cavity must be evacuated and drained. Next the pus must be allowed to escape from the nose by removal of the large masses of granulation-tissue with which it may be blocked.

Such obstructions are best removed as thoroughly as possible with the snare. Sometimes the sharp spoon or the nasal-forceps are useful adjuncts. Where the pus is flowing from above the middle turbinated, we must remove a large portion of the latter to gain access to the region above; by such means alone does the treatment become feasible, while it is even more helpful when the middle spongy bone is itself diseased. A portion may be removed by the snare, and as much more as proves necessary broken off piecemeal with the forceps. Such a procedure will at once ensure a removal of some of the diseased parts and permit freedom of drainage. Next day proliferating granulations may be destroyed with chromic or monochlor-acetic acid, or with the electric cautery. After each operation the nasal fossa must be carefully freed of blood by washing, and then dusted with iodoform or other antiseptic powder, and the nose plugged with iodoform wool. Boric acid in these cases acts remarkably well. Although suppuration rapidly diminishes under such treatment, the intricate nature of the ethmoid bone makes it impossible to produce asepsis.

Ethmoidal cells

The complete clearing of the nose of all granulations is often a work of many weeks; and in some cases we may eradicate the disease from the lower portion of the nose only to find pus flowing from the ethmoidal cells themselves. We may even break down the walls of some of these, and so permit drainage and cleansing; but although the patients are greatly relieved in the diminution of the discharge, yet I cannot say I have ever known such a case actually cured. But, as will further appear when discussing empyema of the antrum, there is a probability that some cases tend to spontaneous recovery.

Caution

In no case should much be attempted in the way of removing necrosed portions of bone from the roof of the nose. Cases are on record where such attempts have entailed fatal results.[1] Yet it must be remembered that such disease in itself may be a source of cerebral abscess. Dr. Curnow has shown me notes of a case occurring in his practice where the patient died of meningitis, the consequence of ethmoidal disease. Doubtless other similar cases have been placed on record.

3. Cysts and abscess of the middle turbinated bone are found of varying size, in my cases varying from that of a filbert to such as would probably contain half an ounce or more of fluid. When very large they

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[1] *Diseases of the Nose*, Spencer Watson, F.R.C.S., p. 417. Case of Rouge's of Lausanne, terminating in meningitis and death.

may form adhesions to the septum, inferior turbinated body, and even the floor of the nasal fossa. They invariably produce more or less deviation of the septum to the opposite side, and sometimes induce considerable flattening of the bridge of the nose from separation of the nasal bones and nasal processes of the superior maxillæ. This distension and flattening are more or less symmetrical, the deviated septum on the other side from that containing the cyst being there the immediate cause of the pressure. The contents of the cysts are usually mucous, with more or less polypous growth attached to the inner wall; but, as has already been remarked, they may be atheromatous. In the instance mentioned of the latter there was, as might be supposed, no development of polypi in the interior, although these were found to a small extent on the outside. In the case of abscess of the middle turbinated the pus had found an outlet into the cavity of the maxillary sinus, presumably after adhesions had been formed between the cyst-wall and the outer wall of the middle meatus. From the antrum the pus reached the interior of the nasal fossa, apparently through the normal opening, as there had at no time been any evidence of retention of the discharge in the form of swollen face, etc. On opening the cavity of the middle turbinated abscess it was found more or less completely filled with pendulous masses of granulation-tissue.

Osseous cysts and abscess

Cf. p. 91

Symptoms

The symptoms differ in no way from those due to other forms of obstruction, pressure, or irritation within the nose. Thus we find the not uncommon consequences of stenosis in the form of chronic inflammation of the pharynx and larynx, and the further respiratory passages; besides which there may be various auditory troubles due to Eustachian obstruction.

As consequences of the pressure, in five of the cases referred to, external disfigurements, adhesions to neighbouring structures, and intense trigeminal neuralgia were developed, and, as resulting from the irritation, there were sneezing and rhinorrhœa. Only in the case of abscess was there a purulent discharge, and other symptoms referable rather to the coexistent empyema of the antrum.

Diagnosis

The diagnosis presents no difficulty. Whenever an osseous tumour presents itself in the middle meatus of such a size that it is obviously something further than a simple osteophytic periostitis, whether presenting an osseous surface covered only by mucous membrane or whether it is concealed partially or entirely by polypoid growths, the probability is strongly in favour of cyst. When, moreover, these appearances are accompanied by a purulent and fœtid discharge, one may safely surmise that he is dealing with a suppurating cyst or abscess of the middle turbinated. The diagnosis is finally substantiated by the removal of a portion of the walls of the tumour by snare or forceps.

Treatment

The treatment is simple enough in cases where the tumour has not attained enormous dimensions. The simplest way of effecting removal is to throw a strong snare round the mass and remove as large a portion as possible. The remaining portion of the walls may afterwards be broken away with forceps. When the cyst is very large, and adhesions have formed to neighbouring structures, the adhesions must be severed in the manner most easy of accomplishment—that is to say, with the knife or electric cautery. In some cases possibly a saw might be necessary. Then, a sufficiently large hole having been made, a pair of strong forceps is introduced, and the walls torn away piecemeal.

CHAPTER VII

MUCOUS POLYPUS

Ætiology, Symptoms, Diagnosis, and Treatment

We now pass on to the discussion of mucous polypi. It is useful to retain the word *mucous* in order to distinguish them from fibrous and malignant growths. The pathology and microscopical characters have already been minutely discussed in a previous chapter, and it is now only necessary to speak of their clinical aspect.

Ætiology

A few words are still needed, however, on the subject of ætiology. From the pathological facts it will be concluded that polypi result from a peculiar metamorphosis to which inflammatory products are, from one cause or another, specially liable within the nasal cavities. There is often in these cases, moreover, a strong hereditary influence, which would appear to predispose not only to the local inflammatory trouble, but also to the degeneration of its products into polypus tissue. There is probably no special dyscrasia conducive to its formation. A case has been recorded in which polypus followed intra-nasal fracture.[1]

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[1] Gerdy, *Des Polypes et de leur Traitement*, Paris, 1883, pp. 4, 5, quoted by Sir M. Mackenzie, *loc. cit.*, vol. ii. p. 357.

Woakes teaches that polypus is but a symptom of bone-disease,—a theory not endorsed by my clinical observations.[1] Nevertheless, it must be admitted that where we have necrosis of bone, molecular or otherwise, with suppuration, we generally find more or less disposition to the development of œdematous granulation-tissue indistinguishable microscopically from some forms of simple polypus. Lastly, it must be mentioned that polypus is by no means uncommon in patients of middle or past middle life who suffer from chronic bronchitis, and who are consequently said to be asthmatics.

Author's statistics

Like all inflammatory affections tending to hypertrophy or hyperplasia, nasal polypus occurs rather more frequently in men than in women. Out of ninety-two cases treated by myself, fifty-six, or 61 per cent, were men, and thirty-six, or 38 per cent, were women. These growths are seldom met with before puberty, though my colleague, Dr. Bond, has reported two cases of the ages of eleven and eight years respectively.[2] The youngest of my cases were, among the women, eighteen years, and in the men, thirteen years. Yet it would appear that they generally occur at an earlier age in women than in men, judging from the fact that the average age at which the former sought relief was thirty-four years, that of the men being thirty-eight; while half the women, and only 20 per cent of the men, were under thirty. It is impossible to ascertain the age at which the growths have actually commenced in the majority of cases.

The symptoms of nasal polypus are generally those

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[1] *Nasal Polypus*, etc., 1888.

[2] *Brit. Med. Journ.*, 10th December 1887.

Subjective symptoms of obstruction to breathing, anosmia, pharyngeal and laryngeal irritation, and chronic catarrh. They usually date from a time when the patient found himself growing very susceptible to cold in the head, the attacks gradually increasing in frequency until he was never free from catarrh. In cases of only partial obstruction, especially if only one side be affected, the patient may be unconscious of, and may strongly deny, any such inconvenience. When complete obstruction exists, the sufferer complains of difficulty in breathing. This he experiences especially on taking any unwonted exertion and during sleep; in which case he not only snores, from the air impinging through the mouth on the lax velum and causing it to vibrate, but he may say he often wakes up struggling for breath. Occasionally he breathes through the nose while snoring, the noise being due mainly to the difficulty the air experiences in passing through the stenosed nasal passages.

Nasal reflexes Sometimes he suffers from cough, asthma, lachrymal irritation, and neuralgia, some to be considered as reflex-symptoms. He may complain of dizziness, loss of memory, inaptitude for mental exertion, symptoms to be referred more properly to the anæmia resulting from interference with respiration than to direct or reflex irritation. Occasionally the sufferer will assert that there is something flapping in his throat or nose, and the noise may even be audible to a bystander—a phenomenon occurring when a pedunculated polypus or flap of hypertrophied mucous membrane is the cause of obstruction.

Another symptom, more distressing to the patient's friends than himself, is a perpetual sniffing, varied by frequent and unsatisfactory attempts at blowing the nose. The nasal flux may be so excessive that the patient's pillow is stained with it; while the constant attacks, specially aggravated in the morning, may prove very exhausting. The speech is thick and guttural from a semi-paretic condition of the palate, as well as possessing the usual characteristics of nasal obstruction; while there is often difficulty in chewing and trouble in drinking. The symptoms are all more or less aggravated during damp weather, owing to the hygrometric properties possessed by these œdematous structures. When respiration has been conducted through the mouth for any length of time, the alæ may acquire a tendency to collapse, and so aggravate the distress. It sometimes happens that nasal breathing is restored during sleep, but only to be accompanied by loud and peculiar snoring: as a rule, however, much complaint is made of the parched mouth and throat. The sense of smell is usually gravely implicated, although taste, even of flavours, etc., may be almost normal. In such a case no doubt the access of odoriferous particles to the posterior parts of the olfactory mucous membrane is not interfered with by any neoplasm, the posterior ends of the middle and superior spongy bones being very rarely involved in the disease. Deafness from catarrhal implication of the Eustachian tubes, or direct mechanical occlusion, is not uncommon; nor must it be forgotten that epiphora or lachrymal abscess may result from pressure on the nasal duct. The orifice into the antrum of Highmore is probably never occluded by these growths, since every case of abscess in this cavity associated with nasal polypus gives exit to its pus within the nose. Nor can we hold that polypus of the nose is in itself a cause of empyema of the antrum; rather we must assume that the caries, with which the two affections are associ-

Subjective symptoms of nasal stenosis

Cf. p. 42.

Empyema of antrum

See p. 171

ated when found in conjunction, is the primary source of these objective symptoms. But this point will be further discussed in the chapter devoted to empyema of the accessory cavities of the nose.

Aprosexia

A bad case of nasal polypus is a distressing and unpleasant object. The open mouth, the distended and shapeless bridge, the collapsed alæ, the eczematous lip, the watery eyes, and the general look of stupidity, partly real, being the *Aprosexia* of Guye of Amsterdam[1], and partly only apparent from the characterless expression of the mouth, render the sufferer a pitiable object. Guye applies this new term (*α* priv. and *προσέχειν τὸν νοῦν*) to an inability to fix the attention, the result being great inaptitude for intellectual work, which, when persisted in, is liable to lead to vertigo. He ascribes this condition to obstruction of the communications between the lymphatics of the dura mater, and those of the mucous membrane of the nasal fossæ, said to exist by Retzius, etc. I have not been able to define these symptoms in many of my cases, though in bad instances patients generally bear witness to the great relief to their mental faculties after removal of the growths.

Objective symptoms

Physical characters of polypus

Mucous polypi are pinkish, bluish, sometimes greenish or yellowish semi-transparent bodies, arborescent vessels being frequently seen on the surface, as well as ramifying in the gelatinous substance of which they consist. After irritation by the pocket-handkerchief compressing them, by the electric cautery or other destructive agents, they become inflamed, red, and lose much of their transparency. They readily yield their water after removal, especially when cut, becoming wrinkled and shrivelled. They have a singular capacity for absorbing moisture, even from a damp atmosphere, and hence the patients' pretty general complaint that the nose is more obstructed when the mercury falls. If, after removing a polypus, we immediately weigh it, and then immerse it in water for an hour or two, we find it has increased its weight by half as much again or more. Examining it while still in the nose, we find that a polypus pits under pressure of the probe, although the depression is quickly effaced. It is more or less movable, according to the latitude of its attachment. There is sometimes a distinct fibrous pedicle, sometimes no more than a slightly constricted base, and occasionally, chiefly in recent cases, the growth is merely sessile. Those polypi situated farther back and projecting into the naso-pharynx are the most often distinctly pedunculated, the action of gravity no doubt having a share in the elongation of the pedicle. These last, when hanging low enough to be constantly compressed by the contraction of the pharyngeal constrictors and soft palate, become greatly condensed and opaque on the surface. On section we find an external symmetrical zone of fibrous tissue enclosing the usual transparent gelatinous substance within. But except when thus condensed, these posterior polypi reveal the most typical structure; the number of cells being smallest, the resemblance to mucous tissue being greatest, and the presence of cysts, sometimes forming the great bulk of the tumour, being most frequent. The reason why cysts are more frequent posteriorly is probably found in the fact that the number of glands increases rapidly as the hinder parts of the nasal fossæ are approached. Polypi situated anteriorly also become condensed and

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[1] *Deut. Med. Woch.*, 1887; and *Journ. of Laryng. and Rhin.*, December 1889, p. 499.

Various appearance

Cysts

Papilloma

See p. 97

fibrous when their tendency to growth is greater than the capacity of the cavities in which they lie; but the fibrous tissue seldom forms the distinct envelope found in those suspended in the naso-pharynx. When the polypi are forced within the grasp of the alæ, or project externally, they not only become red and fleshy, but occasionally develop a papillomatous covering distinctly villous or lobulated. Such at first sight might easily be mistaken for the lobulated hypertrophy of the inferior turbinated erectile tissue.

Sites of polypi

The usual seat of polypi, at any rate in those patients who seek relief, is undoubtedly the free border and under surface of the middle turbinated bone, together with the outer wall of the middle meatus; yet, according to Zuckerkandl's autopsies, the superior meatus is the most frequent site. They probably never arise from the septum or inferior turbinated body, although hypertrophies of the erectile tissue are not infrequently mistaken for them. The growths occupy a varying space of the nasal fossa, sometimes exerting so much pressure on the septum as to cause its deviation to, and the obliteration of, the opposite fossa, as well as producing separation of the nasal bones.

Young growths

The affection is usually bilateral. Those smaller polypi which grow from the superior meatus and descend between the middle turbinated and the septum may inadvertently be pushed out of sight by a touch of an instrument; but forcible blowing of the nose will usually bring them again within the field of vision. When the polypi are young and so small as to cause no subjective obstruction, we perceive, on the under surface of the middle turbinated bone, small, reddish, transparent, smooth excrescences, or a distinct fold of mucous membrane of similar appearance. Such may readily escape notice; or even when detected, they may be considered merely as a hyperplasia of the mucous membrane. But they are not sensitive to the probe, and if left alone will develop into unequivocal polypi. In this early stage they are invariably, as far as my observations go, associated with a chronic inflammation and hyperplasia of the mucous membrane in the immediate neighbourhood. Yet in old standing cases and with solitary polypi, especially with those situated far back, there may be little to find fault with in the appearance of the neighbouring mucosa. Possibly in such cases the neoplasm actually protects, and by pressure diminishes, the inflammatory tendency of the neighbouring parts.

Number of polypi

The number of polypi present in one fossa is occasionally considerable and generally difficult to estimate; a dozen distinct tumours would be an unusual number. Cases are occasionally related where as many as eighty or a hundred have been removed; but the method adopted has probably been one of detaching successive portions of large polypi, and considering each as a distinct growth. Usually three or four are met with on one side at most; while in the majority of cases not even this number is attained. Solitary pedunculated growths are generally situated far back and are cystic.

Associated conditions

See Chap. X

The most frequently associated conditions are hypertrophies of the inferior turbinated and septum, those of the latter being cartilaginous or osseous. Besides these, we have very commonly hyperplasia of the middle turbinated, involving the bone in conjunction with the muco-periosteum; as well as, more rarely, a curious hyperplasia of the upper and anterior part of the triangular cartilage. Posteriorly the turbinated bodies appear swollen and œdematous, so that they are scarcely distinguishable from polypi themselves (see Fig. 4 in Frontispiece). Suppuration of bone, ethmoidal disease, and empyema of the antrum are also occasionally encountered in cases where polypus affords the principal objective features.

Asthma

A general catarrhal condition of the respiratory mucous membrane is not uncommon in conjunction with polypus. Hence the patients are said to be asthmatics; while the relief sometimes afforded them by restoring nasal respiration is held by some to be proof that the spasmodic contraction of the bronchi originates in intra-nasal irritation. This point will demand fuller discussion in Chapter XI.

Diagnosis

The diagnosis seldom presents any difficulty, if it be remembered that the inferior turbinated growths are less regular in outline, lobulated or dendritic, more substantial, and firmer in their attachments than polypi. When the latter present irregularities of surface due to the development of epithelial elements, they are confined to the most prominent spot, and do not extend on to the lateral portions. When the papilloma is extensive, the surface in the cases I have seen is villous rather than cauliflower-like. Occasionally a malignant growth has every appearance of a benign polypus; this I have known both in a round-celled sarcoma and in epithelioma. But on attempting to remove the growth, the free hæmorrhage and the friability of the structure are sufficient to suggest malignancy. The enormous masses of granulation-tissue seen in cases of tuberculous disease and lupus are never so œdematous as a polypus. They are, moreover, attached, for the most part, to the septum, and are accompanied by a purulent discharge. They are not covered with epithelium, and about their bases the ulcerated surface may be discovered without much difficulty.

Resemblance of malignant growths to polypi

Polypi may persist for many years. They sometimes cease to grow worse, but have little or no tendency to spontaneous recovery. Cases where such a result is stated to have occurred have probably been mistaken as to their true nature. The prognosis of most cases is highly satisfactory, provided the patient is prepared to extend the period of treatment as far as is necessary. In uncomplicated cases a cure of existing polypi can be promised in every case; but it is impossible to ensure against the production of fresh growths at some future period. Usually, however, as far as my experience extends, the cure is practically permanent. On the other hand, with complicated cases, where, for instance, there is suppuration in the nose and empyema of the antrum, our prognosis must be very guarded, seeing that the polypi are but symptoms of graver disease. In many cases, where simple polypus is associated with hypertrophy of the septum or of the inferior turbinated, the tendency to recurrence will not disappear until nasal breathing is made easy by the rectification of these conditions.

Prognosis

The treatment of nasal polypus may be discussed under two headings: (1) the methods of removal, and (2) those for preventing recurrence. There are various antiquated manners of treatment seldom now adopted, such as injecting the growths with astringents, destroying them with chemical caustics, and so on. Of such I have had little or no experience, and am consequently not entitled to speak of them. Strong injections of perchloride of iron and similar appliances to the outside of the polypus (Reeder[1]), chloride of zinc (Erichsen[2]),

Treatment

Injections and caustics

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[1] Quoted in Gross's *System of Surgery*, vol. ii. p. 340.

[2] *Science and Art of Surgery*, seventh edition, vol. ii. p. 394.

nitrate of silver (Nelaton[1]), and insufflations of tannic acid (Bryant[2]) have all been advocated. But few specialists adopt such painful means; and the general practitioner has long learned to distrust them.

Avulsion

The systems which we will consider are those of mechanical avulsion and that of the electric cautery. Among the former the forceps and the snare are the only means in general use. Voltolini speaks of the facility with which large growths can be removed by a sponge forced through the nasal fossæ; a method advocated by Hippocrates, and, as practised by him, minutely described by Sir Morell Mackenzie.[3]

Use of forceps

Objections to forceps

The use of the forceps is best discussed according to their employment for large or small polyps. In the case of the former their disadvantages appear to outweigh their advantages. When the polypus is very large, it is impossible to know precisely what we are including in the grasp of the instrument, and I have seen the whole of the middle turbinated bone inadvertently torn away by an experienced hand. On the contrary, it is in these very cases that the snare is so difficult of application. Yet so uncertain is the use of the forceps, that if any bone is accidentally brought away, it is customary to consider it advantageous, whereas, if not, one is apt to pride himself on his skilful manipulation. Sometimes it may indubitably be desirable to remove the portion of bone from which the growth springs; but in that case it is necessary to have clearly in view the portion seized, and not to effect it haphazard. Yet some of the most skilful hands prefer the forceps to any other instrument for ordinary cases. The hæmorrhage and pain are, however, always more formidable with forceps than the snare.

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[1] *Pathologie chirurgicale*, second edition, vol. iii. p. 748.

[2] *Lancet*, February 1867, p. 235.

[3] *Loc. cit.*, vol. ii. p. 353.

Varieties of forceps

For small polypi, the relations and extent of which one can easily discern, the forceps prove extremely serviceable. Wide-bladed, coarsely serrated, and slightly curved instruments are generally the best, the simplest mechanism being all that is necessary (Fig. 32). Occasionally slenderer instruments like

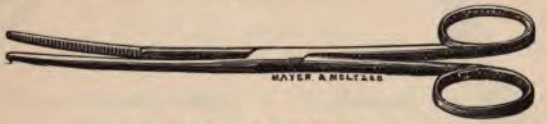

FIG. 32.—Polypus-forceps.

Lister's sinus-forceps may be very useful, especially for polypi situated far back or above the middle turbinated bone. Whenever possible, we should twist the polyp round and round until it breaks away, although the surrounding mucous membrane must thereby be considerably contused. Sometimes, however, the only feasible plan is to pull them forcibly from their attachments. There is great variety in these instruments. Perhaps no improvement has been so good as Mackenzie's punch-forceps (Fig. 33). The handle is fixed

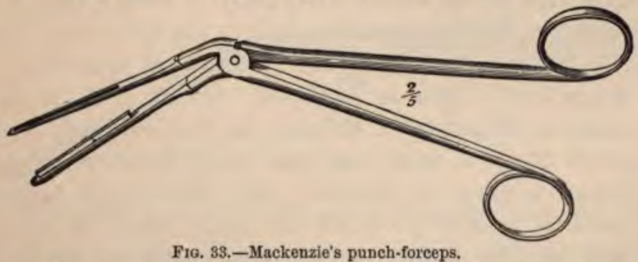

FIG. 33.—Mackenzie's punch-forceps.

at the proper nasal angle on the slender blades, which contain a longitudinal punch and groove respectively. Those which lock, like Beverley Robinson's, are sometimes handy, and Mackenzie's axial forceps (Fig. 34) are useful for polypi situated high in the concavity of the middle turbinated bone.

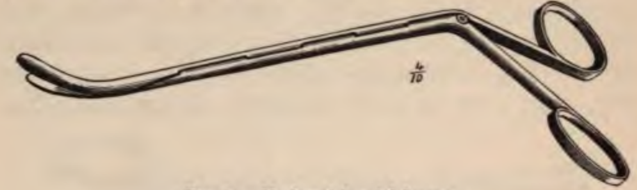

FIG. 34.—Mackenzie's axial forceps.

Snares, their superiority

Varieties of snare

Mackenzie's

Whenever possible, it is preferable to remove the great bulk of a polypus with the cold wire snare, even if the operation be completed with the forceps. From the point of view of the slight hæmorrhage, as well as the minimised pain, the wire *écraseur* is far superior to the forceps; but it needs some dexterity, a good light, and a handy instrument. *Cœteris paribus,* the amount of blood lost appears to be in inverse ratio to the skill of the operator. There are almost as many varieties of snares as forceps; but the difference in utility is greater among the snares. The best for all practical purposes is Mackenzie's cog-wheel *écraseur* (Fig. 35). The wire can be wound up quickly or slowly with the thumb as the instrument is held in the right hand, the left being free to alter the direction of speculum or the patient's head as required. Others, such as the many modifications of Hilton's, are available only with a soft noose of wire-twist, and are of little use in the denser varieties of polypus. But Mackenzie's instrument is equally good for all kinds, while it is the only possible instrument for those cases where it is necessary to hitch the noose over the polypus with the forefinger in the pharynx. A recent and great

Hovell's

Krause's

improvement in this instrument is T. Mark Hovell's modification, the special point being the facility with which the snare can be withdrawn and used repeatedly. For the same reason Krause's new instrument (Fig. 36) is useful for rapid hospital work.

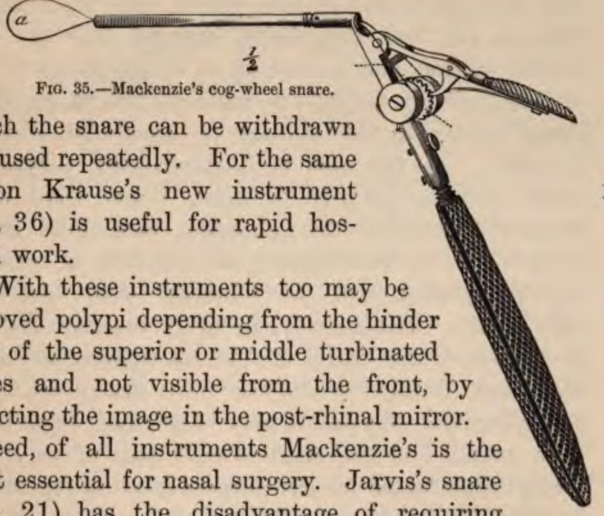

FIG. 35.—Mackenzie's cog-wheel snare.

With these instruments too may be removed polypi depending from the hinder part of the superior or middle turbinated bones and not visible from the front, by reflecting the image in the post-rhinal mirror. Indeed, of all instruments Mackenzie's is the most essential for nasal surgery. Jarvis's snare (Fig. 21) has the disadvantage of requiring two hands for its use; while the author's (Fig. 22) is too slow for ordinary polypus work.

Method of operating

The method of operating is as follows. The loop is first introduced in a vertical position, and the upper edge thrust between the septum and the polypus, or between the latter and the outer wall, on that side, in

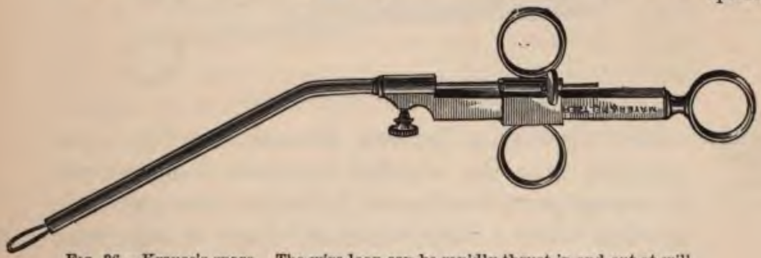

FIG. 36.—Krause's snare. The wire-loop can be rapidly thrust in and out at will.

fact, where there is least room. When pushed as far up as will permit of the lower margin being rotated over the other side of the growth, this movement is effected, the loop thus being brought into the horizontal position, and pushed up on to the narrower neck or base. Every polypus is more or less of an exceptional nature in the method of manipulation to be adopted. In the case of pedunculated polyps the noose must necessarily be much larger than would grasp the pedicle. In tightening, care must be exercised not to pull upon the polypus, or a much smaller portion will be removed than had been calculated. Consequently, in every case, as the loop is tightened, the barrel of the instrument should be advanced farther or higher into the nares. For steadying the polypus, it may be grasped even before it is included in the snare with a pair of very light forceps constructed for the purpose (such as represented in Fig. 37), the forceps of course being thrust through the loop before seizing the tumour.

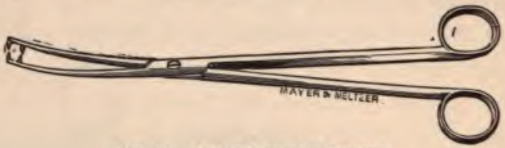

FIG. 37.—Author's toothed forceps.

Growths in superior meatus

In operating on growths situated very high up or springing from the superior turbinated bone, a small hook may prove serviceable in holding the growth in position, while a very fine snare must be insinuated between the spongy body and septum (Fig. 38). Polypi which extend from the choanæ into the post-nasal space are sometimes too large to be included in any snare which can be passed through the anterior nares. In such a case the best plan is to convey a noose of soft, copper-wire twist into the pharynx by means of Bellocq's cannula. Withdrawing this, and leaving the loop in the pharynx, the ends are then threaded in the barrel of a suitable instrument, such as Wild's, the noose is hitched over the growth with the left forefinger in the naso-pharynx, the instrument is run into position in the nares, and an assistant fixes the ends to the cross-bar. Then, on tightening the noose, the polypus may be torn away.

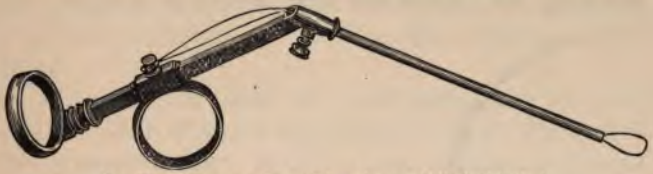
FIG. 38.—Fine snare for working above middle turbinated.

Incandescent snare

Many operators prefer the snare made incandescent by the electric current. Its method of introduction is not different from that described above. But as it is tightened, the trigger (C, Fig. 23), which completes the electrical circuit, is occasionally pressed, and thus the wire burns through the constricted portion. There are no material advantages in this procedure, while there is the great disadvantage of inflammatory action, induced by the heat and steam generated by the hot wire. The incandescent gives no more guarantee than the cold snare of non-recurrence.

Cocaine

It is scarcely necessary to state that cocaine should be applied freely before any operation on the nose. A 10 per cent solution will generally suffice; but 20 per cent gives more certain results, and with actually less expenditure of the drug. A fine nasal spray producer (Fig. 39) is the most suitable method of application, as we can thrust the point behind and on all sides of the growth. Two or three minutes after applying the cocaine we may proceed to operate. In long-standing cases the mucous membrane has generally become more or less anæsthetic.

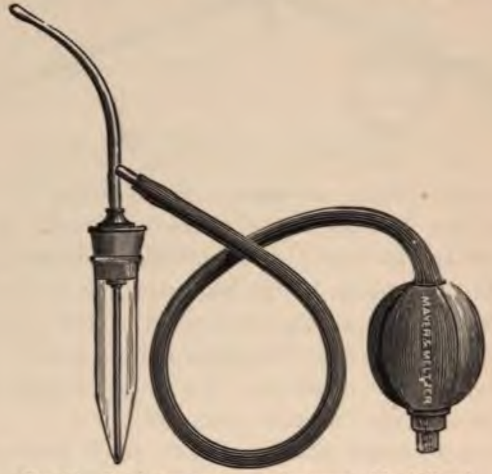

FIG. 39.—Cocaine spray for anterior nares. The ball and vessel can be held in one hand.

As a rule, no treatment is needed after the operation. Sometimes, however, after the removal of a large growth, an acute coryza supervenes in consequence of the unaccustomed exposure of the Schneiderian. Occasionally the inflammation is very severe and spreads to the pharynx and larynx. In such cases it is always of a dry nature, the mucous glands striking work, as it were, while crusts of muco-pus collect about the stumps of the polypi and on the septum, and may become somewhat fœtid. The ordinary treatment of such a condition is all that is called for; and a liberal use of the *lotio alkalina* will soon restore

See p. 151

After-treatment

a healthier condition. But bearing in mind such a possibility it is advisable, if the weather be inclement, to plug the nostril loosely with cotton-wool, which should be removed as soon as the patient reaches home.

Prevention of recurrence

Electric cautery

For the prevention of recurrence there are two methods, both of which may be relied upon. The first is the galvano-cautery. If this is used so that the pedicle or base is thoroughly destroyed, our object is gained; but if used timidly and not properly localised, we may be surprised at a continual recurrence. A precautionary word in the interests of over-sensitive patients may not be amiss. There is never any occasion to let the sufferer see the incandescent point, which in itself is sufficiently alarming. But the mucous membrane well anæsthetised with cocaine, and the burner not ignited until *in situ*, the patient need not know the precise nature of the caustic which he may be told is about to be applied. There is great variety in the shape and size of the cautery-burners (Fig. 40). It is advisable to have several at hand. They can be attached to the handle already mentioned (Fig. 23), or Mackenzie's instrument for the same purpose may be employed. A single accumulator cell with rheostat, as made by Coxeter, is the most manageable battery.

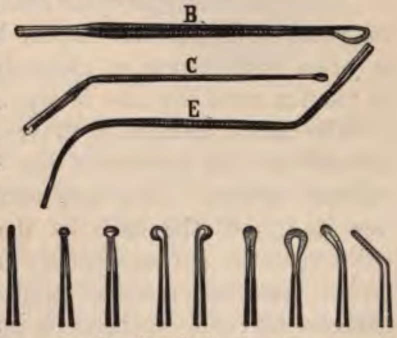

FIG. 40.—Cautery-burners.

It is generally advisable to apply the cautery immediately after removal of the growth by the snare,

Conditions favourable to cauterising

else, before the patient pays a second visit, some recurrence may have taken place. But a clear view of the structure to be destroyed is essential; and all bleeding must have ceased before this can be obtained. Cold water is generally a sufficient remedy, and, with a mop of cotton-wool wrapped round a probe, the region to be cauterised may be wiped clean (Fig. 41). One not inconsiderable advantage in using the galvano-cautery immediately is the diminished sensibility of the neighbouring mucous membrane, which, however, soon regains its normal condition after removal of the obstruction. But when the hæmorrhage is at all troublesome, it is better to pack some antiseptic wool into the bleeding spot and leave the cauterising for a day or two. Several operations are generally required before the polypi are completely eradicated. And even when all fear of recurrence is apparently over we should not speak too confidently.

FIG. 41.—Mop of cotton wool attached to probe.

The most satisfactory plan both for the patient and the surgeon's reputation is to require him to repeat his visit as often as necessary at increasing intervals of weeks or months until the cure is convincingly established.

Removal of bone to which growths are attached

The second method of preventing recurrence is the removal of that portion of the bone from which the polypus springs. This may easily be effected if the free margin of the bone be the site of the pedicle. Otherwise, the galvano-cautery is less destructive of normal parts, and easier of application. For removing portions of bone, Mackenzie's punch-forceps or nasal bone-forceps may be used; or for the anterior extremity, we may employ Jarvis's or other form of *écraseur*. Mackenzie's is scarcely stout enough.

When polypi are situated high, springing from the upper surface of the middle turbinated bone or far back in the concavity of the middle, it may not be possible to employ either of the methods advocated. But in such cases some consolation is found in the reflection that few polypi recur more than three or four times after thorough extirpation with the snare or forceps.

Cleanliness

During the whole course of treatment it is advisable to keep the nose clean with alkaline hand-washes, as there is a strong liability in the secretion to become very tenacious, if not inspissated, and consequently difficult of removal in the ordinary manner. Should there be any tendency to fœtor, insufflations of iodoform may be employed. Such applications are best inserted with a dwarf-insufflator (Fig. 42).

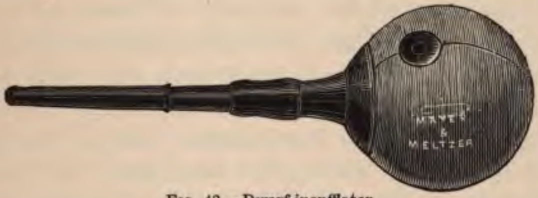

FIG. 42.—Dwarf-insufflator.

Polypus in dry rhinitis

Before leaving the subject, it may be remarked that there is one case in which a polypus may not only be left, but, if possible, its growth may even be encouraged. This is in the rare case where, in the course of a dry rhinitis, a polypus makes its appearance. From it, as a stimulus to secretion, a beneficial effect might be expected; yet in spite of every care it will probably shrivel and disappear.

CHAPTER VIII

RHINITIS SICCA

1. Mucous or Simple Dry Rhinitis. 2. Muco-Purulent or Atrophic Rhinitis ; Ozæna.

PRELIMINARY to discussing those affections, the most prominent symptom of which consists in a dryness of the mucous membrane, it is necessary to indicate that disorders where deficiency of secretion occurs merely as an accident or concomitant symptom, the essential feature being found in some more pronounced objective appearance, are not included under the heading of dry rhinitis. For instance, various conditions of enlargement of the middle turbinated not uncommonly present dryness of the mucous surface; while simple anæmia of the nose, with collapse of the erectile tissue, is frequently associated with deficiency of secretion. Such facts have already been enlarged upon in their respective places.

Conditions excluded

There may be some question as to the propriety of classifying together the two affections falling under the heading of this chapter, seeing that, as the context will show, they are entirely different, and in some respects opposed in their ætiology and pathology. The justification for their association is found in the fact

Confusion in nomenclature

that in both the dryness of the mucous membrane is not only the most prominent objective feature, but is responsible for subjective symptoms common to both. Moreover, the two affections, remarkable as it will appear, have hitherto been confounded together and described as one complaint; the fact that one should be accompanied by fœtor, and the other not, being considered inexplicable.

Simple rhinitis sicca

1. Rhinitis sicca, in which the secretion consists almost entirely of mucus, appears to be altogether dissociated from the forms of chronic rhinitis already described. It is found, for the most part, under two distinct types—the plethoric and the anæmic. The former occur in men approaching or past middle life, of full habit, probably gouty, and amongst the middle and upper classes rather than in the poorer hospital patients. When women are affected, the same constitutional conditions prevail. In both sexes there is frequently, perhaps generally, a suspicion of mild alcoholism, and the tongue is always more or less furred. In the anæmic cases the cause is more often purely local, and is sometimes found in direct sources of irritation, such as dust, flour, soot, etc.; while occasionally the occupation of the patient has confined him in gas-lit, unventilated, and overcrowded rooms. When the fact of an irritating London fog producing a temporary dryness of the mucosa is realised, it is not surprising that similar and persistent sources of irritation should induce a chronic diminution in secretion.

Ætiology

Alcoholism

Subjective symptoms

The subjective symptoms generally refer to the pharynx, the vocal functions, or the hearing. The patient complains of a dry, cobweb-like feeling in the throat, of huskiness or actual aphonia, or of deafness and fulness in the ears; sometimes it is a grievance that he never needs a pocket-handkerchief, but, on the contrary, is often constrained to hawk thick phlegm from the throat.

Occasional sneezing

Occasionally he may have intercurrent, perhaps daily, attacks of sneezing and rhinorrhœa, in spite of the general dryness of the mucous membrane; the explanation of the paradoxical symptoms being that the crusts, gradually increasing in size, eventually become detached, and act as mechanical irritants to the membrane on which they lie. But sternutation is the exception rather than the rule.

Crusts in naso-pharynx

Sometimes the patient produces extensive hard crusts, which, he says, he has coughed up, but, from their dome-like configuration, have evidently been moulded in the vault of the naso-pharynx, or sometimes over the extremity of one of the turbinated bodies. These crusts are of no great thickness, and in this respect differ conspicuously from those of ozæna. In such cases the process of inspissation may extend not only into the pharynx but even into the larynx and windpipe, when the patient may actually expectorate large quantities of greenish-black crusts which have been accumulating for several days and seriously impeding respiration.

Asthma

A patient in this plight may be excusably supposed to be asthmatic; and, before the extrusion of the offending mass, there may be some real anxiety as to the interference with respiration. Crusts may form in the anterior nares, collecting especially on the septum.

Epistaxis

These the patient is apt to remove with the finger, thereby often producing excoriation and frequently epistaxis. As a further consequence there may be ulceration, sloughing of a larger or smaller portion of the triangular cartilage, and perforation.

Perforation of the septum

Thus such a mishap may result from simple inflammatory conditions, although, when produced in such a manner, the ulceration never extends to the osseous septum.

Anæmic cases rare

These severer cases of post-nasal rhinitis sicca almost invariably occur in overfed men and women, although I have had a few who were distinctly anæmic. One was a case of some interest in that the patient had recovered from ozæna of many years' standing, but still retained the dry condition of the post-nasal mucous membrane, together with a similar condition of the larynx and trachea; nevertheless, the stench had vanished and the anterior parts of the nose secreted well. Indeed, it not infrequently happens that although the posterior parts of the nose or the naso-pharynx may be the seat of the disease, the anterior region is fairly moist; but where the latter are markedly dry, we always find dryness in the naso-pharynx.

No marked fœtor

As a rule, there is no special fœtor in the patient's breath, a point which immediately distinguishes these cases from ozæna, syphilitic necrosis, etc. Not infrequently there is a faint, stale, vinous smell in the breath, which it is difficult to dissociate from a similar odour due to the patient's alcoholic tendencies.

Objective examination

Vascular turgescence

On examining the nose the condition is at once manifested. In the plethoric cases we perceive the thin blackish-gray crusts adhering to the septum, the middle turbinated, and, least frequently, the inferior spongy body. Where there are no crusts the surface is dry and glazed. The erectile tissue is generally turgid, respiration being consequently more or less obstructed. The colour of the mucous membrane is dusky and purplish in colour. The anterior third of the middle turbinated is often enlarged, but the inferior shows no indication of hypertrophy. The septum is

No hypertrophy

not infrequently deflected and thickened on one side, so as to cause almost complete unilateral obstruction. In this case the stenosed side usually presents a normal degree of moisture, while the other, abnormally patent to a corresponding degree, is affected with severe dry rhinitis, mucous crusts being adherent on all sides.

Continuing the examination with the post-rhinal mirror, a similar condition is manifested in the post-nasal space. As has already been remarked, we sometimes find it seriously affected, although the anterior parts are sufficiently moist. We perceive in the vault crusts similar to those found anteriorly, except that, from prolonged irritation of the membrane on which they lie, there may be a little purulent secretion adherent to the shells of inspissated mucus. Here also the mucous membrane is intensely congested; the turbinated bodies are pink instead of gray, but not hypertrophied. On washing away the crusts we may discover some increase in the lymphoid tissue on the posterior wall, sometimes in the form of two folds running vertically on each side of the median line, growing more prominent as they ascend and merge into Luschka's tonsil. In the central furrow thus formed the mucus may cling very tenaciously. In this case we have one of those conditions enlarged upon by Tornwaldt of Dantzig in 1885 as a peculiar disease of the pharyngeal bursa (or tonsil) formerly undescribed.[1] But there is no clinical warrant for admitting "Tornwaldt's disease," as it was for a time called, into our nomenclature, the symptoms being essentially those of a post-rhinitis sicca. That the mucus tends to cling tenaciously to this central depression is accounted for

Tornwaldt's disease

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[1] *Ueber die Bedeutung der Bursa Pharyngea fur die Erkennung und Behandlung gewisser Nasenrachenraum-Krankheiten*, Wiesbaden, 1885.

by the anatomical conditions of the crust, in that it is almost surrounded by the membrane to which it is attached. Besides the implication of the naso-pharynx, there is nearly always more or less pharyngitis sicca and a laryngo-tracheitis. In those severe cases where the inspissation of mucus extends into the larynx, we may see it lying in blackish crusts over the inter-arytenoid fold, or preventing the approximation of the cords from its agglutination to the anterior commissure. In these there is always and inevitably severe congestion and swelling of the laryngeal mucous membrane. More rarely we may see greenish-black crusts far down adhering to the tracheal wall. In the anæmic cases we generally find the dryness associated with some graver condition, such as enlargement of the middle turbinated. But, apart from this, we sometimes observe an idiopathic dryness of the mucosa, independently, moreover, of collapse of the erectile tissue. In these cases, as distinguished from the plethoric, immediately described, we find a greater tendency to localising of the dryness, especially in the neighbourhood of the middle turbinated. The lack of free secretion is not infrequently unilateral, while the septum is only exceptionally involved. Consequently we less often find the remoter effects of insufficient moistening of the inspired air. The pharyngitis sicca is less pronounced, and the patient less frequently complains of voice-trouble.

Examination of larynx and trachea

There is no great difficulty in diagnosis, provided the main facts are kept well in view. The distinction from ozæna and simple collapse of the erectile tissue will be further considered in tabular form under the head of the former disease. In this place, therefore, it will suffice to give the main features of differen-

Diagnosis

See p. 159

tiation. Ozæna occurs for the most part in children and anæmic women, as contrasted with the typical temperament of those suffering from simple dry rhinitis. The characteristic odour, the yellowish-green crusts, the wide fossæ seen in ozæna form a picture that cannot be mistaken for anything else.

Diagnosis must also be carefully made between primary dry rhinitis and dryness of the mucous membrane, the result of anæmia, and associated with collapse of the erectile tissue. Examination of the condition of the inferior turbinated usually suffices. In simple collapse of the erectile tissue there are seldom any crusts visible, although the catarrhal condition of the higher regions may lead to inspissation of mucus or muco-pus on the middle turbinated. This, again, is distinguished from the incrustation occurring chiefly on the septum as generally observed in primary dry rhinitis. In doubtful cases the constitutional condition may help a correct conclusion. Cases also where dryness of the middle turbinated is secondary to some structural disease of that body must also be carefully excluded.

Anæmia

Syphilis

In some cases of late secondary or tertiary syphilis we may have a dry condition of the mucous membrane without any suppuration or necrosis beyond, perhaps, in tertiary cases a perforation of the triangular cartilage. In such there may be nothing to distinguish the simple dry rhinitis from that due to syphilis; and we ought in all cases to make cautious inquiry for concomitant symptoms and history. But it is quite certain that perforation frequently occurs where there is no suspicion of the constitutional contamination; although, if we discover osseous perforation, the probability is strongly in favour of syphilis. In cases of tertiary necrosis the danger consists rather in confounding it with simple ozæna than with dry mucous rhinitis, seeing that in the latter there is little or no peculiarity in the odour of the breath. But in old-standing syphilitic cases, where necrosis is arrested and the exfoliation accomplished, we often have a dry condition of the mucous membrane strongly resembling that under discussion. But here the loss of bone substance, and perhaps the falling in of the nose, together with the history, will establish the diagnosis.

Lupus In lupus the adherent scales and crusts are purulent and greenish-yellow, so that the diagnosis here has to be made from ozæna rather than from simple rhinitis sicca.

Prognosis The prognosis is favourable in cases where prolonged treatment is possible, and especially where the dryness of one nasal fossa is mainly caused by stenosis of the other, provided this can be rectified.

Treatment The treatment of simple dry rhinitis is conducted upon general principles. If the disease is unilateral and the other side obstructed by an ecchondrosis of the septum, the latter must be immediately remedied so as to relieve the dry side of the excessive demand upon its unnaturally limited supply of water. Having restored the breathing passages, much may be effected by keeping clean and giving rest to the dry mucous membrane by plugging that side with cotton wool, and so allowing respiration to be conducted through the other. The best lotion for cleansing is a non-stimulating solution of borax and bicarbonate of soda (Form. I.) This should be used as often as necessary, two or three times a day. When the crusts are closely adherent to the septum, they must be carefully detached by softening and washing, as they are not infrequently associated with a superficial excoriation or actual ulceration.

The sore surface should then be painted over with a camel-hair brush soaked in some emollient paint, such as Formula XX. The patient should be directed to keep this frequently applied. The dryness in the pharynx must be combated in a similar manner. When large crusts form in the naso-pharynx it may be necessary to wash them away with a post-nasal syringe (Fig. 43); and sometimes considerable force is required. For the subjective sensations of dryness in the throat a carbolic acid lozenge, or a borax pastil, may give great relief. For the laryngeal and tracheal dryness an inhalation of creasote (Form. X.) may prove of advantage; but if there be actual crusts in these regions, an alkaline or sodium-chloride spray, inhaled for five or ten minutes as often as necessary, may be required to detach the adherent masses.

Post-nasal syringe

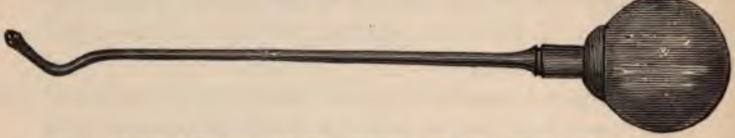

FIG. 43.—Lennox Browne's post-nasal syringe. The termination should be at right angles, else great difficulty will be experienced in introducing it behind the velum.

Stimulation to be avoided

All stimulation of the nasal mucous membrane should be avoided as far as possible, seeing that it is generally erroneous to stimulate any organ that has struck work. Rest, at any rate in the first instance, should be the principle upon which our therapeusis is conducted. But if after careful trial this should prove insufficient, we may employ gentle stimulation, such as may be afforded by adding four or five grains of chloride-of-sodium to the ounce of our alkaline lotion. In the most chronic cases it may be necessary to persist in the treatment for many months, and in not a few cases the patient will never be comfortable without his daily nose-lotion.

Constitutional treatment

In every case the constitutional condition must be attended to and prescribed for on general principles. Great improvement often follows immediately on a limitation of the customary alcohol; while laxative salines, taken hot and regularly for a few days, greatly relieve the distress of the subjective symptoms.

2. *Muco-Purulent Dry Rhinitis—Atrophic Rhinitis—Ozæna.*

Ozæna

The muco-purulent form of dry rhinitis has given rise to more discussion than any disease of the nose. It is only necessary to pass in review the many theories that have been held as to its nature, and the innumerable remedies proposed for its treatment, to conclude, on the one hand, that its nature has never been understood, and on the other, that its treatment has never been satisfactorily accomplished. There are, however, certain factors in its ætiology common to every case, and such throw considerable light upon its true nature; while the treatment has but to be conducted with patience and upon a scientific basis to effect in every case a practical cure.

Ætiology

Chiefly in children and young adults

The full consideration of the ætiology of the disease cannot be conveniently considered until the symptoms, anatomical conditions, and pathology have been discussed. At the present stage it will be sufficient to remark that the large majority of patients suffering from this disease are children and young adults—a fact which in itself indicates a tendency, spontaneous or otherwise, towards recovery. The affection usually dates either from an attack of measles, scarlet fever, or other exanthem; from a single or series of bad colds in the head; from a bad blow on the nose, followed by epistaxis; or, lastly, from unassigned causes, such as inherited or tertiary syphilis, struma, etc. For the most part patients either do not remember, or their parents have not noticed in what manner the disease originated. Statistics Of one hundred cases occurring in my own practice sixty-five were females, and thirty-five were males. Judging from the patients' statements, the average age at which the disease commenced was, in the women, seventeen years, and in the men, eighteen years. But from the evidence of clinical experience rather than such statistics, the incipient, perhaps often unrecognised, stage would appear to date from a much earlier period than this. Even when the patients presenting themselves are adults, their trouble usually dates from childhood, while they often affirm that they are better than they used to be. The disease probably occurs, for the most part, among the poor and ill-fed, though it is by no means uncommon among the well-to-do. Occasionally at the commencement of the disease the patient is robust in every respect, though in all cases of some years' duration there is considerable anæmia; from which it would appear that the local disease is mainly responsible for the constitutional disability—an observation entirely supported by the results of local treatment in restoring the general health. Young domestic servants appear to be peculiarly liable to the affection, and girls are far more frequently affected than boys. A certain proportion of the patients present the typical so-called strumous physiognomy. Physiognomy The nose is small, the bridge and alæ wide, the point of articulation with the frontal bone much depressed, and the nostrils look forwards and downwards. The nose sometimes appears to be sunk into the face, as it were, so that the cheeks and upper lip rise up from the attached margins of the nose. The lips are thick, expressionless, everted, and the mouth is generally closed, though sometimes open, from the nose being filled with plugs of inspissated secretion. Even when the patient does not present this typical appearance there is, in the majority of cases, an unusual width of the alæ and osseous frame of the nose. In advanced and atrophic cases the patients are invariably anæmic and liable to all the troubles arising from this condition.

In most cases great width of nose

Symptoms

Advice is usually sought for the foul breath which makes the patient's presence in a room, even when at a considerable distance, sometimes intolerable. Hence the patient, though unconscious herself of the stench, soon learns to shun the company of others, and consequently to lead a more or less secluded existence. There is generally complete anosmia. Only too often, however, the bad odour is ascribed, even by medical men, to some gastric derangement from which the patient may or may not suffer, while she is brought to the specialist for some vocal or pharyngeal disturbance. Occasionally complaint is made that the nose never needs blowing, or that this function is performed only at long intervals, such as of four to ten days, or even as long as six weeks in one of my cases. At these varying periods large crusts are expelled from the nose: the patient experiences great relief, while the odour becomes for a time less intolerable.

Fœtor pathognomonic

The fœtor is so peculiar and penetrating that it needs no description; when once experienced it is never forgotten. The only smell at all equalling it in intensity is that accompanying syphilitic necrosis in the nose; but though this is quite as offensive it has a well-marked though indescribable distinction. The

Crusts

crusts, apparently as the pressure from their augmentation increases, gradually excite a sufficient flow of mucus to detach them, and permit of their expulsion. They vary much in size, being dense and tough towards their centre, but semi-fluid over the area of attachment. In their denser parts they may be almost black, while the more recent additions vary from brown to green and yellow. The patients apparently

Ulceration exceptional

do not suffer from much temptation to pick the nose, or from the irritation experienced by the sufferers from simple dry rhinitis; consequently we very rarely see that ulceration on the septum so common in the latter affection. Nevertheless, severe epistaxis may occur, though very rarely.[1]

Complaint is sometimes made that the child never takes a cold in the head as other children do, although sometimes the onset of the trouble dates distinctly from one or several attacks of severe rhinitis. Or again,

Inability to blow the nose

we are told the patient can never blow the nose properly; the fact being that she cannot command sufficient force to extrude the offensive masses, owing to the widened nasal fossæ, which present the most conspicuous feature in the disease. These children are often rather slow in their mental operations, although there occur many striking exceptions. Sometimes, though rarely, the chief complaint is some inflammatory affection of the eyes. I have occasionally met

Eye-symptoms

with cases of severe suppurative conjunctivitis. Trousseau has lately reported a case where a grayish ulcer of the cornea with hypopion was associated with ozæna and atrophy of the turbinateds. A cure was effected only on treating the nose-disease with disinfectants. He states that he has observed eleven similar cases.[1]

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[1] Beverley Robinson, *New York Med. Journ.*, 24th September 1887.

Objective examination

Width of bridge of nose

Objectively there are certain points in the physiognomy of these patients that are frequently observed, while some in long standing cases are quite pathognomonic. As has been already remarked, the children occasionally present the typical strumous features; while, where these are absent, we very frequently find the bridge and alæ unusually wide. But it is only, I believe, in adults—that is in the old standing cases—that we find that characteristic sinking of the nose into the face, which alone is sufficient to suggest the probability of atrophic changes. This must not be confounded with the flattened nose resulting from necrosis of the vomer. In ozæna there is not so much loss of shape in the nose itself, as that it appears to have receded to a slight extent.

Absence of vibrissæ

Abnormal width of fossæ independent of atrophy

The first point that asserts itself on examining the interior of the nose is the absence of vibrissæ. On inserting the speculum we are immediately acquainted with the essential feature in the disease, the abnormal degree of patency in the nasal fossæ. It is this roominess that is responsible for the supposition that the large majority of cases are atrophic. So widely are the turbinated bones separated that we are always able, after cleansing the nose of obstructing crusts, to obtain a view of the posterior naso-pharyngeal wall, and frequently of the Eustachian tubes, the movements of which we can thus study during deglutition. The middle turbinated bodies leave a wide fissure between them and the septum, unless the latter presents an obstructing ridge, or the middle turbinateds themselves are enlarged from hyperplasia.

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[1] *Soc. de l'Elysée*, 1st April 1889.

Superior turbinated. Collapse of erectile tissue

Atrophy

Colour

Through the olfactory fissure again we may perceive posteriorly the superior turbinated. The inferior turbinateds always appear small from collapse of the erectile tissue; not necessarily from atrophy, as the results of treatment occasionally prove. In cases of long duration we usually have either actual atrophy of both inferior and middle spongy bones, or atrophy of the former associated with hyperplasia of the latter. In advanced cases both middle and inferior turbinateds may have disappeared totally, the outer wall of the nasal fossæ being innocent of the least indication of their former presence. In such truly atrophic cases the opening into the naso-pharynx appears like a comparatively small orifice, above which may be seen the anterior surface, looking downwards and forwards, of that portion of the sphenoid containing its sinus (Fig. 44, cf. Fig. 47). In some such cases it would appear that the ethmoidal cells also must have opened and contributed to the large cavern into which we look. The mucous membrane is everywhere conspicuously pale, unless immediately after washing, more especially with stimulating injections.

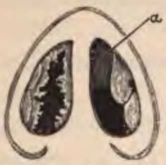

FIG. 44.—The right nasal fossa is filled with crusts covering the atrophied turbinateds. In the left the inferior is collapsed, and the middle somewhat enlarged, though receding far from the septum; *a* points to the anterior surface of the sphenoidal sinus.

Pharynx

Examining the pharynx and post-nasal space we are confronted with the same general conditions of dryness of the mucous membrane, especially over the posterior wall, which is coated by a film, varying in depth and consistence, of inspissated muco-pus. In advanced cases also there is considerable anæmia and probably real atrophy of the mucous membrane. In the more severe cases also there appears to be shrinking even of the muscular structures; while, in the worst instance I have ever seen, in a lad of eighteen, the soft palate was so attenuated in every diameter that he was quite unable to shut off the post-nasal from the buccal cavity. This, with the corresponding atrophy of the superior constrictor, made him quite unable to swallow without regurgitation into the nose, as well as giving to him the speech of the cleft-palate patient. With the post-rhinal mirror we never perceive such complete atrophy of the turbinated bodies as is seen from the front.

Atrophy even of muscles

No subject in the domain of rhinology has given rise to more discussion than the ætiology and pathology of atrophic rhinitis. And this, for several reasons: first, because all forms of dryness of the mucous membrane have been generally included as one disease; secondly, because syphilitic nose-disease has been confounded with ozæna, a term now by common consent reserved for the disease under discussion; and thirdly, because the important feature of the later stages, the atrophy, has been nearly always considered as the essential element in the production of the symptoms. As a matter of fact the atrophy appears rather as a consequence of the disease than as the primary factor; for we see many cases in an early stage where the turbinated bodies present the normal configuration. But, on the other hand, we never see a case in any stage where the nasal fossæ are not abnormally patent—that is to say, where the turbinated bodies, although possibly of full size, attain a normal proximity with the septum. Some, however, have

Pathology and ætiology

Abnormal patency always observed

advanced a theory of occlusion of the nostrils to account for the symptoms; but as Trousseau[1] points out, we often find extreme degrees of stenosis without any ozæna. Indeed, we may go further and affirm that no case of obstructive rhinitis is ever accompanied by any fœtor, unless due to retention of pus from quite other causes. I have seen several cases of unilateral ozæna where the side affected was abnormally patent, the other being in like proportion stenosed, with the secretion limpid and free from pus.

Ozæna never seen with stenosis

Occasionally we see the case in an early stage, when we never perceive any atrophy of the turbinateds, and often not even collapse of the erectile tissue. Yet the fossæ are abnormally wide: there is an unusual interval between the spongy bones and the septum. Even in cases where traumatism is the assigned cause, we find this roominess of the interior. Consequently, seeing that this latter is a factor invariably present even when there is no atrophy, we may ask whether it can be in any way responsible for the subsequent train of symptoms. The only possible influence upon the functions of the nose is that of facilitating the passage of air in either inspiration or expiration; but this is effected at the expense of the velocity of the current. As a river passing between narrower banks increases its speed correspondingly, so the expiratory blast of air passing through a nose abnormally wide fails to acquire a sufficient velocity to drive out the tenacious inflammatory exudations of an ordinary rhinitis. This discharge, especially in children of a strumous habit, or ill-nourished and ill-tended, has a stronger tendency than with the healthy

No atrophy or collapse in early stages

Explanation of the evils of abnormal patency to become purulent. Add to this the stagnation from the causes just mentioned, and putrefactive changes will of necessity supervene; hence the fœtor in the initial stages. Moreover, putrefaction means irritation, and the discharge becomes increasingly purulent. This irritation may induce an inflammatory hypertrophy of the middle turbinated bone and mucous membrane; it may lead by an infective process to suppuration of the ethmoidal cells or the maxillary sinus, and perhaps even of the sphenoidal sinus, though this I have never had any reason to suspect.[1] Again, as the consequence of the inspissation of the muco-pus after coating the mucous membrane, it contracts much like a film of collodion, and causes anæmia of the subjacent structures. The immediate result of this is the collapse of the erectile tissue, and the opening up of the inferior meatus. This anæmising from surface-compression may also contribute to the ultimate atrophy of the structures, and possibly to the absorption of the osseous tissue. Moreover, a similar collapse of the erectile tissue is sometimes observed in other conditions as the result apparently of an analogous process. After removal of nasal polypi, for instance, where previously the inferior turbinateds had presented a normal appearance, there is sometimes induced a muco-purulent discharge, which, owing partly to its tenacity, and partly to the unnaturally widened fossæ, the patient is unable to extrude. It putrefies and produces an ozænic smell; it dries and contracts the venous sinuses

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[1] *Clinical Medicine*, New Syd. Soc., vol. iii. p. 63.

Collapse of erectile tissue

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[1] Dr. A. Bronner relates a case of ozæna caused by suppuration in the sphenoidal sinus, which was cured by scraping the interior of the cavity. But he gives scarcely enough description of the case to indicate whether it should be considered a case of true ozæna, or whether he so designated it on account of the fœtid discharge (*Med. Press. and Circ.*, April 1888). Cf. note on p. 187.

of the erectile tissue. A vicious circle is instituted which, if neglected, might presumably result in true ozæna. Indeed, the removal of polypi has been quoted as a cause of ozænic rhinitis (Schech);[1] and I have myself observed the symptoms of ozæna with collapse of the inferior turbinated body supervening after the same cause. Moure,[2] however, distinctly asserts that the odour after removal of polypi is not that of ozæna. Routier of Prague has recorded a case in which ozæna followed the eradication of a nasal sarcoma.[3] So that we may assume the theory of abnormal patency to be correct so far as it induces a tendency to stagnation and putrefaction of the muco-pus. Nevertheless, in the face of the frequency of cases which must be considered true ozæna where no atrophy exists, we can endorse neither the theory advanced by Gottstein,[4] Zaufal,[5] A. Hartmann,[6] etc., that the primary factor is deficient development of the turbinated bodies; nor that held by Zuckerkandl, who believes the initial trouble to be atrophy of the turbinated bodies.

Corroboration

Width of fossæ inversely to that of antra

There is some ground for supposing that an abnormal width of the middle and inferior meati may depend upon insufficient development of the maxillary sinuses; for on two occasions, when it became necessary to open these cavities from the alveolar border in cases of ozæna, an extraordinary depth of bone was traversed before the antrum was reached. I have further made measurements upon skulls which bear out strongly the supposition.[1]

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[1] *Diseases of the Mouth, Throat, and Nose*, translated by R. R. Blaikie, M.D., 1886, p. 240.

[2] *Maladies des Fosses Nasales*, etc., Paris, 1886, p. 103 (footnote).

[3] *Sarcome des Fosses nasales; ablation; ozène consécutif; guérison*, *Revue de Chir.*, 1887, p. 62.

[4] *Breslauer aerztliche Zeitschrift*, September 1879.

[5] *Aerzt. Correspond.*, 1877, No. 24.

[6] *Deutsch. Med. Woch.*, 1878, p. 145.

Theories as to putrefactive changes

There can be little doubt that the characteristic odour is the result of putrefactive changes, although many authorities hold that it is due to a peculiar process of fermentation (Krause, Fraenkel). Sir Morell Mackenzie, who gives an exhaustive account of the various theories past and present held concerning the disease, inclines to the latter view, arguing that "if a person suffering from ozæna has the nares thoroughly cleansed by a detergent spray, the stench often ceases only for a few hours, returning within so short a period that, though fermentation might have occurred, there would not have been time for true decomposition."[2] Yet it is precisely for this reason that I hold the opposite view; for, if the cleansing be conducted in the manner about to be described, the nose will remain free of stench for twenty-four or forty-eight hours, according to the severity of the case, showing that probably some hours must elapse before the fresh secretion becomes putrefactive. The reason why this form of dry rhinitis gives rise to putrefaction, while that variety where the secretion is only mucous remains sweet, is simply that pus is more prone to decomposition than mucus. Fraenkel[3] considers the tendency to desiccation dependent upon the richness of the secretion in cells, though we find the same liability in the mucous dry rhinitis where the secretion is very poor in cells. It is not very clear why we must consider the stench of ozæna, because it differs from that of necrosed bone or of otorrhœa, which again is quite *sui generis,* as due to some process distinct from putrefaction, as many authorities would have us believe. Thus Krause, as has just been remarked, holds that a peculiar ferment, which cannot be introduced from without, is responsible; while E. Fraenkel, who originated this idea, asserts that it is communicable.

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[1] See Appendix, p. 365.

[2] *Diseases of the Throat and Nose*, vol. xi. p. 329.

[3] Ziemssen's *Cyclopædia*, vol. iv. p. 138.

Krause's autopsies

The former, as the results of his autopsies, says: "The most remarkable thing in our specimens is the presence of an enormous infiltration of round and spindle cells, the cells of which do not show anywhere a distinct contour, but have disintegrated into a fatty detritus, which is often still arranged in the former cell form; and besides this infiltration the presence in the mucous membrane of numerous large and small fat globules, a fact which is very suggestive of an explanation of the origin of the fœtor. . . . The enormous quantity of fat secreted into and beneath the epithelium will quickly undergo disintegration and change into fatty acids in the crusts, and will thus produce the sickening and rancid smell."[1] But E. Fraenkel has not found a similar condition in his cases, and argues that as xerosis of the conjunctiva, to which Krause likens the pathological state, is not accompanied by any stench, the argument is rather weakened.[2] Habermann of Prague partly endorses Krause's observations. But others insist that the changes resulting in the fœtor are due only to ordinary putrefactive changes. Hajek has lately made a careful bacteriological investigation of the disease. He considers the large number of bacteria found in the secretions to be responsible for the fœtor, though their absence in the mucous membrane renders

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[1] *Trans. Int. Med. Congress,* London, 1881, vol. iii. p. 312.

[2] *Ibid.*, p. 313.

Bacilli

impossible any ætiological connection between the disease and the bacteria. He finds the *bacillus fœtidus* a constant and specific organism, the culture of which in gelatine yields the characteristic odour of ozæna. Moreover, he holds that the fœtor of the disease is caused by the desiccation of the secretion, which consequently from its stagnation becomes putrescent.[1]

Origin of stench

It appears to me that in discussing the pathology of the stench and its difference from the ordinary surgical putrefactive odour, the important distinction between the secretion found in ozæna and simple pus has been neglected. In the nasal disease mucus forms a large part of the discharge; and it seems quite possible that the putrefactive decomposition of this combined with that of the pus may be responsible for the specificity of the odour, or if not, of the specificity of the bacillus. This would appear the more likely when we remember that an otorrhœa has quite as distinctive an odour as ozæna, and that in the external auditory meatus the products of putrefaction may differ from those of ordinary pus from its admixture with cerumen.

Is the atrophy a further stage of hypertrophy?

There is little more to be said concerning the pathology of the disease, except in the way of confuting a theory that is pretty generally accepted with but the slenderest warrant. It is supposed, especially by the German School, that the atrophy is a further stage of a condition of hypertrophy, though on what grounds it is difficult to surmise. It may be that the conditions appear analogous to those of the enlarged and cirrhosed liver; or it may be assumed from the frequently concomitant hyperplasia of the middle turbinated with collapse of the erectile tissue or even atrophy of the inferior spongy bone. But that an ordinary catarrhal hypertrophic rhinitis never leads to an atrophic, except where we have caries, I am quite confident; while that simple dry rhinitis, with engorgement of the venous sinuses, never leads to ozæna may be inferred from studying the essential points of distinction between the two diseases. In favour of the theory of a previous hypertrophy we have such observations as those of Schäffer, who affirms that he has watched the process of transition in some cases, and that the hypertrophic stage lasts from eight to ten years—an observation which clearly places his cases beyond the pale of a disease which, beginning generally in early puberty, reaches its most serious aspect in early adult life;[1] or again, such as those of Bayer of Brussels, who states that he has seen several members of a family suffering from ozæna, the elder ones exhibiting atrophy, while the younger suffered from hypertrophy.[2] But neither of these authorities states in what the hypertrophy consisted, and it is quite possible that what they so designate was only a vascular turgescence of the erectile tissue, a blunder frequently committed by some otherwise trustworthy observers.

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[1] *Wien Med. Presse*, 1887, p. 1585; and *Berlin Klin. Woch.*, 1888, No. 33. See also remarks by Demme on Tubercle-bacilli in Ozæna, *Fortschritte der Medicin*, No. 8, 1883, p. 276.

Probable confusion of erection and hypertrophy

No ulceration

That in atrophic rhinitis there is no surface ulceration is admitted by all who have made autopsies in these cases.[3] The only possibility of ulceration is the accidental one resulting in excoriation of the septum

[1] *Monatsschrift für Ohrenheilkunde*, 1881, No. 4. Sir Morell Mackenzie points out that this author uses the term "ozæna" in a very loose sense, including among his cases congenital syphilis and bone disease.

[2] *Trans. Int. Med. Congr.*, 1881, vol. i. p. 314.

[3] Zuckerkandl, *Normale und pathol. Anatomie der nasenhohle*, Wien, 1882, p. 87; Gottstein, *Breslauer aerztliche Zeitschrift*, Sep-

from picking the nose. There is very general consent as to the cirrhotic condition of the mucous membrane, the attenuation of the bones, and the diminution of the blood-vessels; while the glands, both those of Bowman and the racemose, are diminished in number, and present distinct evidence of fatty and granular degeneration. The complete absorption of bone and mucous membrane is a matter of great pathological interest. Possibly the conversion of protoplasm into fat, as found in Krause's and Habermann's autopsies, is the result of anæmia, and the initial step in the absorptive process. And we may remember that a fatty degeneration and absorption of bone coexist in the disease known as osteoporosis, as well as that complete absorption of bone is known to occur without any apparent inflammatory or degenerative changes. But this is a matter that cannot be fully discussed without further microscopical investigation.

Complete absorption of bone

Two or three other theories as to the pathology of the disease deserve mention only for the sake of refutation. Rouge,[1] of Lausanne, introduces a series of arguments to show that only the presence of necrosed bone could produce the odour; while Spencer Watson suggests that the disease may be due to a condition resembling, or identical with, *lupus non-exedens*, and that upon such a supposition are easily explained the crusts and shrinking of all structures.[2] The results of treatment, however, are sufficient to combat each of these theories. One other supposition, that of Michel,

Other theories confuted

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tember 1879, Nos. 17 and 18; Krause, *Int. Med. Congr.*, London, 1881, vol. iii. p. 311; E. Fraenkel, *ibid.*, p. 313; Habermann, *Revue Mens. de Laryng.*, 1887.

[1] *Nouvelle Méthode Chirurgicale pour le traitement Chirurgical de l'Ozène*, Lausanne, 1873.

[2] *Diseases of the Nose*, 1875, p. 85.

of Cologne,[1] has found considerable favour. He holds that the stinking discharge flows from one or more of the accessory cavities, especially the ethmoidal cells. Examination of the nose will prove this to be incorrect in the large majority of cases. Thus if the discharge were flowing from the sphenoidal sinus, we should find it adhering chiefly in the naso-pharynx, and only to the posterior portion of the superior and middle turbinated bodies; while if from the anterior ethmoidal cells it would be seen lying chiefly beneath the middle turbinated. This, though occasionally observed, is quite exceptional. The same argument applies to the maxillary sinus. When the discharge is flowing from high up we see it lying between the middle turbinated and the septum, in which case it may arise in the posterior ethmoidal cells, or what is more probable, from the whole surface of mucous membrane lining the superior meatus.

Diagnosis The diagnosis of ozæna seldom presents any difficulty, although there is great confusion in the terms employed by different observers, as has already been remarked. For the sake of clearly indicating the important distinctions between certain diseases presenting a dryness of the mucous membrane, the various terms for which are often promiscuously employed according to the fancy of the observer, I have drawn up the following table. In it are indicated the main points in the diagnosis of (i) vascular collapse of the erectile tissue, with dryness of the mucous membrane; (ii) simple dry rhinitis, with mucous exudation; and (iii) dry rhinitis with muco-purulent discharge, otherwise ozæna or atrophic rhinitis.

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[1] Quoted by Bosworth, *Diseases of the Throat and Nose*, New York, 1881, p. 227.

Diagnosis of Three Diseases which present a Dryness of the Mucous Membrane.

Diagnostic table

Vascular Collapse of the Erectile Tissue, with Dryness of the Mucous Membrane.	Simple Dry Rhinitis, with Mucous Exudation.	Dry Rhinitis, with Muco-Purulent Discharge; Ozæna; Atrophic Rhinitis.
(i) Chiefly in anæmic women.	(i) Chiefly in plethoric, probably gouty, men; never in children.	(i) Chiefly in women and children, less often in men; all the subjects become anæmic.
(ii) No peculiarity of physiognomy.	(ii) No peculiarity.	(ii) Small, sunken, wide noses, with wide nasal fossæ.
(iii) Mucous membrane anæmic.	(iii) Mucous membrane deeply congested.	(iii) Mucous membrane anæmic.
(iv) Collapse of erectile tissue; no tendency to hypertrophy or atrophy.	(iv) Turgescence of erectile tissue. Tends to hypertrophy rather than atrophy.	(iv) Collapse of erectile tissue; tends to atrophy of all structures.
(v) No ulceration.	(v) Frequent ulceration of septum and occasionally perforation.	(v) No perceptible superficial ulceration.
(vi) Always bilateral.	(vi) Sometimes unilateral.	(vi) Almost invariably bilateral.
(vii) Spontaneous cure may sometimes be rapidly effected, if constitutional disabilities are ameliorated.	(vii) In chronic cases there is small probability of spontaneous cure.	(vii) After many years' duration there is some tendency to spontaneous improvement.
(viii) Olfaction not affected.	(viii) Olfaction generally not affected.	(viii) Olfaction generally abolished.
(ix) Odour negative.	(ix) Odour of breath often alcoholic.	(ix) Breath typically ozænic.
(x) Little or no incrustation; if present, chiefly on anterior third of middle turbinated.	(x) Crusts chiefly on septum and middle turbinated.	(x) Crusts equally distributed over every portion of the mucous membrane.

But beyond the distinction of these diseases there are certain other points to which attention must be drawn.

Physiognomy

As to physiognomy, although the wide and flat bridge of the nose generally points to abnormal width of the nasal fossæ, it must be remembered that the nasal bones and nasal processes of the upper jaws may be widely separate by pressure from within, *e.g.* by polypi, cysts, etc. And, again, it must be pointed out that we may have all anatomical characteristics of the nose, externally and internally indicative of ozæna, without any sign of disease whatever. The abnormal width of the nose would appear to be no more than the condition most favourable for the production of ozæna.

Lupus

From lupus there may occasionally be some difficulty in diagnosis, but only in those rare cases where the external parts are not, and show no sign of having been, implicated in the disease. The crusts in lupus vulgaris may be similar in appearance, but favour the septum in preference to other regions. They adhere very closely, and can scarcely be removed without hæmorrhage. After removal the presence of ulceration or the typical tubercles is immediately sufficient for indicating that the disease is not simple ozæna. So far as I am aware, no case of lupus non-exedens attacking only the interior of the nose has been recorded.

Syphilis

In syphilitic necrosis there may possibly be some confusion between the stench and that of ozæna. An examination of the nose will reveal the true nature of the disease; for in every case probably a probe will reveal the presence of sequestrum. Moreover, there will often be concomitant symptoms, such as perforation of the hard palate or falling in of the bridge of the nose from partial or complete destruction of the vomer. Yet it must be remembered that conditions exactly resembling simple ozæna, as regards crusts, atrophy, and smell, may occur in the course of hereditary or tertiary syphilis, or may apparently be induced after the eradication of the constitutional ailment (Case 42).

Suppuration in accessory cavities

The diagnosis from suppuration of one or other of the accessory cavities has already been partly indicated. It will generally be sufficient to remember that in these cases the discharge is usually unilateral, has little tendency to incrustation, and makes its exit spontaneously; that the fœtor is more conspicuous to the patient than the bystanders, and that olfaction is not materially affected.

Rhinoliths

With rhinoliths also the discharge is unilateral and fluid, though sometimes very offensive. Examination of the nose with a probe will best reveal the nature of the affection.

Prognosis good

The prognosis of ozæna is comparatively good, and, so far as treatment is efficiently conducted, is in every case satisfactory. To this belief I adhere, in spite of the assertion of some eminent authorities as to the incurability of the disease. Mackenzie says it "is rarely if ever cured except in the case of young children, in whom the disease sometimes passes away after it has existed for a few weeks."[1] Of course regeneration of atrophied structures cannot be expected, although Moure of Bordeaux holds out hopes of such a possibility. He has probably mistaken the refilling of the collapsed erectile tissue for the restoration of atrophied structures.[2] Yet in cases of ozæna without atrophy an objective cure may be effected, while in the majority of all cases a symptomatic cure may be considered probable. After the age of twenty or so, the intensity of the odour steadily diminishes as the patient grows older. Judging from my own patients, it is rare for them to seek relief after thirty-five, the oldest of them all being thirty-nine. This points very strongly to the fact that there is a tendency to spontaneous amelioration, if not cure. Mackenzie states that the stench generally ceases altogether about fifty; but I suspect that this often occurs much earlier. The prognosis is of course specially good in those cases where the patients come early under observation, and there is no osseous atrophy. The function of olfaction, however, is rarely restored, though in one of my cases (Case 43), a young lady of seventeen, the sense became practically perfect, although it had been in abeyance so long that she could not remember ever having been able to smell.

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[1] *Diseases of the Throat and Nose*, vol. ii. p. 335.

[2] *Manuel Pratique des Maladies des Fosses Nasales*, etc., Paris, 1886, p. 106.

Tendency to spontaneous improvement

It may appear doubtful whether, in the event of abnormally wide nasal fossæ being the most important ætiological factor, we can look for a permanent cure, seeing that this condition cannot be remedied save so far as the collapsed erectile tissue may be induced to fill the cavities once more. But it has only to be remembered that many cases of abnormal patency are to be found where there is no suspicion of ozæna to realise that, for the production of this disease, the anatomical condition is only a predisposing element, to which must be added the all-important exciting cause in one or other of the manners already detailed.

Treatment

In spite of the innumerable remedies that have from time to time been adopted for the relief of ozæna, the treatment is exceedingly simple, its success depending very little upon the remedy employed, but entirely upon the manner in which it is used. Our fundamental object should be to induce a condition of cleanliness in the nose. For this purpose the nose must be thoroughly and repeatedly washed, and that *by the practitioner himself*; for herein lies the whole secret of success. In the initial stages of the treatment it is almost impossible for the patient or her friends to effect any amelioration. The nose must be washed in bad cases at least every day, and in such a manner as to remove every particle of putrefying pus, so far as the crusts come within the field of vision. This is followed, even when the process is accompanied by a certain amount of pain—which in skilful hands is quite unnecessary—by a sense of the utmost relief to the patient, who is generally willing enough to have it repeated on the morrow. Nothing acts more satisfactorily than warm water, though for our own comfort we may add a little of that excellent deodoriser, Sanitas-fluid. Some authorities recommend a spray, driven by compressed air at pressure of at least forty pounds, as the best means of detaching the crusts. Others combine this with the removal of the offending masses by means of a mop of cotton-wool on a probe, or with forceps, etc. The latter measures, however, are always attended with pain, and often hæmorrhage. Or again, some merely recommend the inspiration of fluids into the nose as a hand-wash—a method generally highly unsatisfactory. The following routine practice I have found most efficient.

The first essential

In the first place, both patient and surgeon are protected in front by a large towel, the need of which will be apparent when the next step is put into practice. A full-size, short Eustachian catheter is

Method of cleansing the nose

fitted to a balloon syringe holding about two or two and a half ounces, such as can be easily grasped and powerfully compressed by the hand, and the syringe is filled with the wash; a speculum is then placed in the nose and the interior illuminated; a stream of water is then injected with sufficient force to detach the incrustations, driving it to this or that point according to the demands of the case. It is never necessary to insert the catheter into the nose; for with an accurately directed current, the nose can be completely cleaned with the greatest ease. At the same time it is remarkable how ineffectual indeterminate syringing is in allaying the odour for any length of time. For the sake of rapid improvement, it is essential that every minutest particle should be swept away. Occasionally a cotton-wool mop will prove of great assistance in removing the semi-detached crusts; but as this is apt to be painful to the patient, and liable to cause epistaxis, I prefer relying entirely upon the syringing. The whole process is necessarily full of discomfort both to patient and practitioner, the chief inconveniences being the passage of the fluid into the pharynx and larynx, and its expectoration over the operator. This, however, is largely obviated by directing the patient to keep the mouth open and to continue breathing through it during the washing; for by this means the soft palate is closely approximated to the posterior wall of the pharynx. After a few experiences the patient becomes very tolerant of the discomfort.

Prevention of inspissation

Beyond the cleansing of the nose, we have two main objects in view, viz. the prevention of further drying of the secretion, and the supply of more blood to the ill-nourished mucous membrane and its subjacent structures. The former of these is best effected by the method devised and advocated by Gottstein. This consists in the insertion into the nasal fossæ of a tampon of cotton-wool, so as to fill completely the widened inferior meatus. He has designed a screw for the purpose of introduction, round which is wrapped the pledget of wool before insertion. When it is introduced sufficiently far and in the required direction, the instrument is withdrawn by unscrewing it from its covering, thus leaving the wool *in situ.* The wool should be non-absorbent, so as not to abstract the mucus when it begins to flow. Gottstein's theory of its action was that it mechanically stimulated the mucous membrane against which it lies, thus increasing the flow of mucus. But one fails to see why the tampon should succeed when the hard crusts themselves fail. The true explanation of the improvement probably lies in the fact that by this means the mucus is prevented from drying, and allowed to flow in a natural manner. But whatever the explanation, there is no question as to the great benefit resulting from the mode of treatment; while it is remarkable how free of smell the nose keeps so long as it is occluded, the inspissation being obviously necessary to the putrefactive changes. Practically it is unnecessary to insert the wool for any distance, it being quite sufficient to plug the nostrils. This, moreover, is of advantage in that the patient can herself change the tampon as often as may be necessary. Some practitioners think it advisable to employ wool variously medicated, as, for instance, with iodoform, boric acid, ammonio-chloride of mercury, etc. These may possibly be of some use, although it is hardly appreciable when associated with the immense benefit accruing from thorough cleansing and the

Gottstein's plugs

Medicated wools

prevention of inspissation. It may possibly be objected that by preventing nasal breathing the throat must inevitably suffer the more. As a matter of fact, nasal respiration, when the nose is in a putrefactive condition, cannot but be pernicious; and mouth-breathing will be rather beneficial than otherwise.

Increase of nutrition

The second requirement, viz. the augmentation in the supply of blood, may be obtained in three ways: either by artificially stimulating the mucous membrane, or by the physical method to be immediately described, or by electricity.

Stimulants

Stimulation is objectionable for the same reasons as apply in the case of similar pathological conditions elsewhere. It is somewhat doubtful whether we are any more justified in stimulating the nasal mucous membrane in atrophic rhinitis than a cirrhotic liver. All stimulants probably leave matters worse as soon as their influence is withdrawn. But should such a means ever prove desirable, we may employ a powder consisting of equal parts of red gum, gum-acacia, and iodoform, to be frequently blown into the nose with an insufflator, or taken like snuff. Trousseau speaks highly of powders insufflated into the nose after cleansing with the douche. He uses specially white and red precipitate (see Formæ. XV. and XVI.)[1] The various medicated wools may be inserted into the meati according to Gottstein's method. For this stimulating purpose nothing is better than the ammonio-chloride, or alembroth wool. Among fluids I have found tincture of sanguinaria particularly serviceable; five to thirty drops added to half a pint of warm water is of sufficient strength, some patients being peculiarly intolerant of its action. Glycerine, with which a tampon should be saturated, is probably an unobjectionable stimulant, and acts very satisfactorily. Boroglyceride also, used in a similar manner, proves beneficial.

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[1] *Clin. Med.*, New Syd. Soc., vol. iii. p. 67.

Physical method of augmenting blood-supply

The physical method of increasing the blood-supply is the most efficient, if only the patient has sufficient forbearance to conduct it to a successful issue. It will be readily understood if the importance of the laws of nasal respiration, as detailed in the first chapter of the volume, is appreciated; and it will be sufficient in this place to point out that, if by any means we can diminish the barometric pressure within the nasal cavities, we shall inevitably increase the blood-supply to the walls of the partial vacuum thus created.

The only way to accomplish this will be to obstruct partially the orifice by which the air enters the vacuum; or, in other words, to plug the nostrils with cotton-wool, but not sufficiently, of course, to obliterate the passage. Obviously, the whole point of the treatment consists in the patient persisting in breathing through the nose in spite of the great difficulty thus artificially induced. Nasal breathing under such inconvenience should be carefully persisted in for two, three, or more hours a day; and, if possible, while taking exercise, because of the increased demand for air thus induced.

Results

Almost immediately, at the outset of this laboured nasal breathing, the mucus begins to flow freely from the dry or atrophic mucosa, the best guarantee indeed one could have of the fact of the increased blood-supply. Very few days of this treatment engender distinct objective evidence of improvement, to wit, heightened colour and diminished dryness. After some weeks the inferior turbinated bodies are distinctly fuller; while, in one of my patients, a small ecchon-

Difficulties in physical method

How overcome

Author's nasal respirator

drosis on the septum began to hypertrophy in an unmistakable manner, after three months' use of the partially pervious tampon. With children naturally this plan of treatment is not applicable, seeing that, with the least nasal stenosis, they resort to buccal respiration; and, indeed, with adult patients it is an exceedingly difficult matter to induce them to persist in a course of treatment which entails so much discomfort, and the principle of which they can hardly appreciate. Nevertheless, with an intelligent patient it proves more satisfactory than any other means with which I am acquainted; while it has this marked superiority over the electrical treatment, to be immediately described, in that the patient can apply the treatment herself. To make the system appear more reasonable to the patient, I have devised a small nasal respirator which will fit into the nostril and carry some essential oil, such as that of eucalyptus, pine oil, etc. (Fig. 45). The necessity of breathing this vapour into the nose will be readily understood, although the primary object be to obstruct the passage through the nose. The apparatus is exceedingly simple and easily constructed. Two pieces of rubber tubing are taken, each ½ to 1 centimetre in length, the inner diameter of one being ·008 m., and of the other ·004 m. Two long threads are then drawn from a piece of lint and wrapped round the walls of the smaller tube, so that the whole surface, inside and out, is completely covered. The smaller is then included in the larger tube, the cotton is saturated with eucalyptus oil, etc., and the piece is inserted into the nostril. The rubber readily adapts itself, and is self-re-

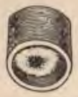

FIG. 45.—Nasal respirator for partially obstructing access to the nasal fossa.

taining without being visible. Some variations in the size of the tubes may be required for different cases. The best effects from this physical treatment are seen in cases where there is little or no atrophy, where, in fact, our object is to increase the flow of mucus and fill out the collapsed erectile tissue. Yet in cases of advanced atrophy great good may be effected, although we can hardly expect regeneration of vanished parts. Probably these patients will never be able to dispense with occasional washing of the nose. But of this I have no positive information, as hospital-patients cease to attend as soon as they find their condition sufficiently ameliorated; while I have never seen the more severe consequences among my private cases.

Most suitable cases

Electrical treatment

Dr. Bryson Delavan, of New York, has had much success in the electrical treatment of atrophic rhinitis. He applies the positive pole of a constant current battery to the nape of the neck, and the negative directly to the mucous membrane by means of a piece of copper wire enclosed in a pledget of moistened cotton-wool. The strength of the current should range between four and seven milliampères, and the duration should be long enough to excite a slight watery discharge,[1] usually from five to twelve minutes. The method is strongly endorsed by Dr. Hartmann of Baltimore.[2] I have no personal experience of the treatment.

Constitutional remedies

Beyond the local treatment there is generally strong necessity for constitutional remedies. Cod-liver oil, and the various preparations of bark and iron, are generally beneficial; while bracing sea-air is of great advantage —Margate, the East coast, or Worthing being preferable according to the special circumstances of the case.

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[1] *New York Med. Journ.*, March 1887.

[2] *Ibid.*, March 1889.

Beneficial effect of local treatment

Yet without any constitutional treatment there is probably no local disease in the body where local cure has a more remarkable effect upon the general system. This might be easily accounted for if only by the mental relief the patient experiences in being no longer shunned by her friends. Add to this the fact that she no longer inspires biological contamination with every breath, and one ceases to be surprised at the striking improvement.

CHAPTER IX

SUPPURATION IN THE ACCESSORY CAVITIES OF THE NOSE

Empyema of antrum

EMPYEMA of the maxillary sinus has within the last few years assumed an importance commensurate with the recent great strides that have been made over the whole field of diseases of the nose. And to those whose attention has been directed to the affection in question, it is becoming clear that hitherto they have, through want of knowledge, permitted a great number of cases to escape their notice. This, at any rate, is my personal experience; and judging from the accounts of the disease given by other authors, it must be inferred that, along with cases placed on record by them, others of a different clinical aspect have, in all probability, escaped detection.

Ætiology

In passing in review, in the first place, the ætiology of the affection, it is necessary to indicate clearly the fact that pus in the antrum is no more than a symptom, sometimes only an accident, of other well-defined diseases of the nose, except in a small minority of the cases. This statement will doubtless lay itself open to criticism; but the account of the symptomatology of my own cases will be sufficient to convince the reader of the fact. The large majority of these cases undoubtedly had their origin in diseases of the nose. Thus, while

Divided opinions

twenty-four of my thirty-five cases, a synopsis of which is printed in the Appendix of Cases, were unquestionably due to nasal disease in the first place, judging rather from the evidence of long-standing grave disease of the nose than from any statements of the patients, the usual impression, especially with the general surgeon and dentist, is that the inflammatory mischief almost invariably originates in the teeth. Specialists on the whole appear to endorse this belief. Thus, while Christopher Heath, Semon, Fraenkel, Moritz Schmidt, Schech, Stoerk, Heryng, and M'Bride assert that the antral affection generally begins in disease of the teeth, Zuckerkandl, Ziem, Krause, Hartmann, Gougenheim, Baratoux, Bronner, and myself have shown that the large majority of our cases have originated in disease of the nasal mucous membrane.[1]

Discrepancy accounted for

The discrepancy of opinion, however, is very easily accounted for upon the supposition that many cases where the nose has been the seat of origin have been overlooked, owing to the presence of more urgent coexisting affections, such as polypus, caries, etc., sources of suppuration within the nose itself. That the surgeon and dentist should generally meet with cases where the teeth are responsible for the trouble, is accounted for by the fact that the surgeon is consulted for a swollen face, and the dentist when this is associated with toothache. On the other hand, the patient suffering from a discharge from, or obstruction in, the nose is more likely to come under the observation of the nose-specialist.

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[1] For an admirable *résumé* of the present position of the question see a paper read by Dr. Felix Semon before the Odontological Society, 4th November 1889. Also an article by A. Friedlaender in the *Berlin Klin. Woch.*, No. 37, 1889, p. 815.

These latter cases it is not intended to discuss in this place; for the full particulars of their ætiology, diagnosis, and treatment are fully detailed in the text-books of surgery and dentistry. Little or nothing has been added to the knowledge of the disease since it was described by John Hunter. Only three of my patients ever complained either of toothache or a swollen face, the usual complaints being either obstruction in the nose, a foul smell or taste in the throat, or lastly and most frequently, of a unilateral discharge from the nose.

Unilateral discharge

This last fact of itself should be sufficient to suggest to the observer a strong probability of the antrum being implicated, if not the primary source of the discharge. Among the other subjective symptoms, the most frequent is that of a fœtid smell in the nose or nauseous taste in the mouth. As a rule the olfactory sense remains intact, so that the patient is perpetually haunted with the stench himself, although it is seldom sufficiently intense to be offensive to his neighbours—a point in striking contrast to the state of affairs in ozæna, where the faculty of smell is entirely lost, and the patient is offensive only to his fellows, and but indirectly to himself. Sometimes the fœtor is intermittent, appearing only at definite hours of the day. The discharge is occasionally so profuse that half a dozen or more handkerchiefs may be required every day, according to the patient's habits; yet in other cases it is not sufficient to attract much attention, the patient being more concerned about his "bad breath."

Fœtor

Olfaction intact

Variation in flow of pus

Sometimes we are told that the discharge flows more freely in one position of the head than another. Most frequently it is with the head held between the knees that the pus escapes; sometimes it is only then. Or again, with one patient the flow increases when lying on the same side, while with another the reverse condition is found. But as a rule the discharge flows less frequently into the naso-pharynx than through the anterior nares. The discharge is generally unilateral. Yet in two of my cases (see p. 336) both antra were involved. Of the remaining thirty-three, in only eight was the right sinus involved, while in the other twenty-five the disease was confined to the left side.

Pain

Supra-orbital neuralgia

Pain on percussion

Pain is often a prominent symptom. Out of my cases it was spontaneously complained of in fifteen instances, while in sixteen cases it could be elicited by percussing over the malar or nasal bones. The usual seat of the pain, when spontaneous, is in the cheek, sometimes radiating towards the ear, or more often diffused and ill-defined. In eight cases (Cases 7, 16, 17, 22, 23, 25, 28, and 35) the pain was localised chiefly in the supra-orbital region. In five of these (Cases 7, 16, 22, 23, and 28) it supervened every morning regularly at the same hour, increasing steadily in intensity until the antrum was evacuated and pus began to flow from the nose. In one (Case 16) the pain was preceded by formication and pricking, and in another (7) it gradually increased in intensity until the whole head was racked with the most intolerable headache. In both these cases, it must be noted, the pus was observed to be flowing from above the middle turbinated bone—a point the importance of which will be indicated immediately. The method of eliciting pain is by percussing with the point of one finger the malar prominence or the side of the nose, and comparing the discomfort produced with any complained of on repeating the process on the other side. It seldom amounts to more than discomfort. Beyond these local subjective symptoms, there is often some general disturbance of health, especially if the discharge has continued for many years. We find all the symptoms of anæmia, the patient's health being considerably disturbed by the perpetual presence of the putrefactive odour, which he often cannot be persuaded is not perceptible to the bystanders. Consequently he is more in dread of being offensive than is the subject of ozæna.

General malaise

In passing to the objective symptoms, it may be stated at the outset that there is often considerable difficulty in making a precise diagnosis. Some cases are fairly simple; yet none are absolutely positive, for the reason that the diagnosis is based almost entirely upon the situation of the discharge as it is seen lying in the nose. Whenever, in fact, we perceive an opaque, canary-coloured, purulent discharge, which must be carefully distinguished from the transparent muco-pus of simple rhinitis, lying in the concavity of the middle turbinated body; which discharge, after being wiped away, is immediately reproduced; we need have no hesitation in opening the antrum with the strongest probability of evacuating pus. So far I have been but once misled. Yet it must be remembered that the frontal sinus and the anterior ethmoidal cells also open into this region, and that consequently suppuration in either of these regions would yield a similar appearance. As a matter of fact, it is more than probable that, in the event of pus being formed in the anterior ethmoidal cells, the antrum will prove to be a receptacle of pus, even if itself not directly involved in the disease. Empyema of the frontal sinus is apparently so rare apart from occlusion of its duct—in which case we have external evidence of the mischief—that we may exclude it from consideration. Probably it is

Objective symptoms

Anatomical points

Frontal sinus

as often involved in inflammation as the antrum; yet its anatomical arrangement, with its outlet leading funnel-like from its lowest point, is sufficiently different from that of the antrum to account for the fact that, in the one case, the inflammation subsides in spontaneous recovery, and, in the other, terminates in chronic abscess. No recorded case of presumed suppuration in the frontal sinus without external evidence throws much light upon the difficulty; and I have seen none myself.

Situation of pus

There are other points in the examination of the interior of the nose presenting matters for serious consideration. In seven of my cases the pus was flowing from above as well as below the middle turbinated bone. From this it must be concluded that in these cases there was other source of suppuration than the antrum. And as a matter of fact, in each of these cases a certain amount of discharge has persisted after that from the antrum had ceased. Nor was the washing of the antrum in these cases sufficient to remove that portion of the discharge which was seen lying between the middle turbinated and the septum. In one of these cases (No. 15), after removal of the greater portion of the middle turbinated bone, the pus was seen to be distinctly flowing from the anterior ethmoidal cells into which a probe could be thrust. In such cases as these it is probable that there exists a caries of the bony structures, and that the process has broken down the thin partition between the infundibulum and the upper part of the antrum.[1] Indeed, in all of these cases the antral trouble has responded very readily to treatment, while the actual source of the disease has persisted in the most intractable manner.

Pus generated in other regions may flow into the antrum

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[1] I am informed by Dr. Curnow, Professor of Anatomy in King's College, that occasionally direct communication exists between both

In some cases there is even more evident intranasal disease. Thus in twenty-four of my cases there was distinct evidence of either present or former inflammatory mischief. In fourteen of these there were well-marked polypi, or, in other words, translucent œdematous granulations, blocking the respiratory passage; in seven there was caries of the middle meatus, while in other seven there was a curious appearance which demands more than a passing reference. It is probably the condition which has been described as "cleavage of the middle turbinated," such as is said to occur in the disease called necrosing ethmoiditis.[1] This supposition is probably correct, as these are the only cases falling under my notice which in any way resembled a splitting of the bone in question. The appearance strongly simulates that of a duplicated middle turbinated body; for, immediately below that structure, we perceive a smooth or granular body projecting from the outer wall of the nose. The pus is seen flowing from between this and the middle turbinated body. Into this space a probe may be thrust till it reaches the outer wall, while between the neoplasm and the outer wall there is no passage. In fact, the new growth is an inflammatory production attached immediately below the *ostium maxillare*. The cases in which this occurred were all of long standing. It was probably the sole evidence of a former inflammatory mischief which

Polypus and granulation-tissue

So-called cleavage

Inflammatory growth beneath middle spongy bone

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the anterior and posterior ethmoidal cells and the summit of the antrum; while the partition between the infundibulum and antrum may be greatly attenuated or actually deficient, so that the contents of the frontal sinus in some cases might flow into the cavity below. I have examined three specimens in the Museum of the College of Surgeons, cut transversely through the maxillary sinus, which exhibit openings into the anterior ethmoidal cells.

[1] *Nasal Polypus*, etc., by E. Woakes, 1887.

had undergone spontaneous resolution, leaving, however, the antrum full of pus ; the latter having been originally formed when the bone in the neighbourhood of one or more of the openings was carious, and poured into the cavity of the antrum, from which there was no sufficient outlet. There setting up further irritation, it perpetuated the condition ultimately resulting in a chronic offensive discharge from the nose.[1] The neoplasm is usually mainly osseous in its structure, though sometimes it is of a firm, fibrous consistence; it has apparently no tendency to increase in size. When bony, it is probably the result of an osteophytic periostitis; when fibrous, it would be due to the organisation of pre-existing inflammatory products. Yet in considering the diagnostic value of this neoplasm, it must be mentioned that I have seen four instances of it where there was no pus in the antrum.

Caries

In seven cases, as has been remarked, there was positive evidence of the existence of a caries of the middle meatus as revealed by the blunt probe. In those cases where the pus was flowing from above the middle turbinated, there was probably bone-disease in the ethmoidal cells; for, remembering the intimate connection of mucous membrane and periosteum, one can hardly conceive of a condition of the former which could result in the secretion of pure pus, as distinguished from muco-pus, and yet leave the bone unaffected. In those cases where the probe reveals carious bone there is almost invariably a quantity of œdematous granulation-tissue in its immediate neighbourhood. Mixed with this inflammatory growth—which, it must be remembered, would usually fall under the designation of polypus, and is covered like all these structures with a ciliated epithelium—is the purulent secretion. Thrusting the probe into the middle of this mass, it impinges sooner or later upon unmistakably carious bone. And from clinical observation it would appear that whenever we have bone-disease in this region, with the formation of pus, some of the discharge in the course of time finds its way into the antrum, without this cavity being necessarily involved in the production of the pus. Such cases, moreover, are the most amenable to treatment, so far, at any rate, as the maxillary sinus is concerned.

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[1] That this is probably the correct interpretation of the cases supposed by some to represent a cleavage of the middle turbinated is substantiated by the history of Mr. R., Case No. 5, in the synopsis. He had been under treatment for three years previously to his consulting myself. He was told that he was suffering from necrosing ethmoiditis, which at the termination of this course of treatment was asserted to be cured. "But, unfortunately," said the patient, "the discharge continued as badly as ever!" I found that the greater part of the middle turbinated had been removed ; the neoplasm in question was projecting from the outer wall; while above this was flowing a thick purulent and fœtid discharge. The antrum was evacuated, and in six weeks' time the patient was cured. Since then I have not seen him. I quote the case merely to indicate the sort of diagnosis sometimes made under the title of necrosing ethmoiditis, and to illustrate the probable explanation of the cleavage said to occur in this rarely observed disease.

Caries and polypus. See p. 86

Sometimes the polypi assume enormous proportions, so that they demand the same handling as though they were ordinary nasal polypi independent of bone-disease. Indeed, it is probable that where we have polypus, together with a purulent secretion prior to operation, the antrum is full of pus. In this supposition I have never been misled; and I know of several cases besides my own where empyema of the antrum has been correctly diagnosed from this combination of objective symptoms alone.

Trans-illumination

Its method

Effects

A further means of objective diagnosis was recently added to our list by Voltolini. It consists in a method of trans-illumination, first employed by that lamented observer for diagnosing thickening of the alæ of the thyroid cartilage in perichondritis of the larynx. Voltolini's method consisted in the insertion of an incandescent electric lamp into the pharynx in a darkened room: the neck became illuminated, while any difference in the density of the two sides of the thyroid cartilage became at once apparent by the lessened intensity of the light. Though in this situation not of much practical utility, the illumination of the face in a similar manner promises to be of some value in the diagnosis of abnormal conditions of the antrum. The method employed is as follows:—A five-volt lamp is attached to the extremity of a tongue-depressor, the lingual portion of which is constructed of some non-conducting material, such as vulcanite (Fig. 46); this is inserted into the mouth and the tongue depressed, while the patient is directed to close the lips firmly. The room is next darkened, and the circuit of the current completed. Immediately a rosy-red light suffuses the face, the cheeks and lips being the most brilliant, the intensity of the light declining as the eyes are approached. It is essential to the success of the procedure that the room should be absolutely dark. According to Heryng's observations,[1] whenever there is pus or a

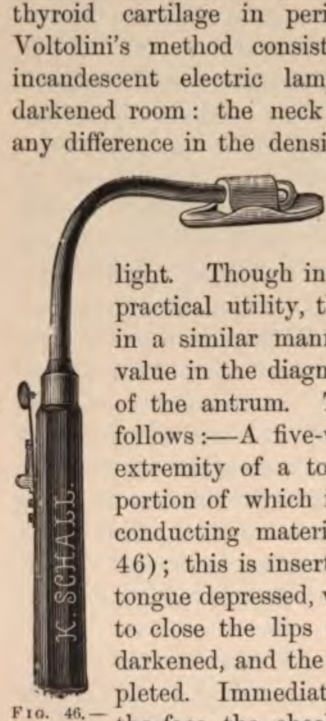

Fig. 46.—Schall's light-bearing tongue-depressor for illuminating the antrum.

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[1] "Die elektrische Durchleuchtung der Highmorshohle bei Empyem," *Berlin Klin. Woch.*, 1889, Nos. 35 and 36, p. 798 *et seq.*

solid tumour in the antrum, that side of the face, especially opposite the malar prominence, is less bright than the other; while, on the contrary, in cystic disease, the side affected will be the more brilliantly illuminated. This latter point had been discovered by Voltolini, who was thus enabled to diagnose a cyst in a case supposed to be a sarcoma, and doomed to the removal of the superior maxilla.

Difficulties in trans-illumination

But in the diagnosis of empyema of the maxillary sinus I have found several difficulties to contend with. Thus, even after the removal of the pus, there is still an obscurity over the side affected, although it is considerably lessened. Then, again, any obstruction to the lumen of the nasal passages materially affects the transmission of light through the antrum. A large gelatinous polypus, I have found, may enhance the brilliancy of the cheek on the affected side, while, immediately after its removal, this side may be the darker of the two, owing to the presence of the more opaque blood. Hence one perceives that any cause leading to a thickening of the walls of the antrum, whether it be an inflammatory condition of the mucous membrane in the interior of the cavity, or an opaque obstruction in the nose itself, may lead to defective illumination; while cystic disease of the antrum or nasal polypus may render the side more brilliant. On one occasion, in a patient suffering from atrophic rhinitis, so dark was one side of the face that, in spite of there being no corroborative evidence, I opened the antrum from the alveolar border and found no pus.

Consequently, it must be acknowledged that this method of diagnosis gives no more positive evidence of the presence of pus than other objective signs. Nevertheless, in a disease where no one point can be said to afford positive proof of its existence, any additional evidence must be of considerable value. Such being the case, it may be admitted that few cases can be satisfactorily investigated without this method of trans-illumination. It is, moreover, so simple, needing no special experience, that it might often be of value to surgeons having no facility in the examination of the nose. Yet it must be acknowledged that its most striking value is in the diagnosis of cystic from solid tumours of the antrum. These, being accompanied by distension of the cavity, present no difficulties in the study of empyema of the antrum so far as it falls under the observation of the rhinologist.

Its clinical value

Concomitant conditions

There remains little to say about concomitant conditions. According to the degree of obstruction in the nose we may find the throat and larynx suffering. The passage of the discharge into the pharynx sometimes excites a reflex cough, or nausea and retching. The most conspicuous consequence of the prolonged suppuration is the debased constitutional condition.

Diagnosis

The diagnosis presents no difficulty except in the directions already indicated. Thus, it is easier to exclude other conditions resembling empyema of the antrum than to make an absolutely positive diagnosis. Ozæna is at once distinguished by the repulsive odour of the breath, and by the fœtor not being perceptible to the patient himself. A foreign body in the nose or a rhinolith is often to be detected only on careful examination of the interior with the assistance of a probe. When such obstructions are situated beyond the field of vision, and are accompanied by a fœtid discharge, the diagnosis is usually difficult. But the

From Ozæna

Foreign bodies

foreign body usually has some history, while a rhinolith is extremely rare. In syphilis of the nose, with a unilateral fœtid discharge, this is generally found as the accompaniment of a sequestrum; and the latter can usually be detected, attached to the vomer or turbinated bodies, by the help of a probe. If not loosened, an ulcerated surface may be discovered in one or other of these regions, at the bottom of which the necrosed bone is felt; moreover, there is often perforation of the hard palate. Simple caries with the exposure of small portions of bone leads to no fœtor, provided the exit of the pus is not interfered with. In empyema of the sphenoidal sinus as well as with disease of the posterior ethmoidal cells the pus finds its exit into the post-nasal space, and is only accidentally, as it were, blown into the nose. In the case of malignant disease of the antrum being associated with a purulent discharge from the nose, the usual signs of distension of the cavity will be present. In the event of these being associated, it may be remembered that in abscess the swelling subsides as soon as the pus gains an exit—such not being the case when a solid tumour occupies the cavity.

Syphilis

Caries

Pus in other cavities of the nose

The prognosis of these cases depends, as will have been gathered from the preceding remarks, upon the origin of the disease rather than upon the length of its duration. In many of the oldest cases it would appear that the intra-nasal disease has undergone spontaneous amelioration, while nothing beyond the evacuation of the antrum remains to complete the cure. Therefore, in those cases where there is no active disease in the nose, we may hope for speedier results than if there be at the same time implication of the ethmoidal cells or a caries of the middle tur-

Prognosis

binated, the extent of which cannot be precisely determined.

Treatment

The treatment of the affection has of late years given rise to as much divergence of opinion as the ætiology, though, before the nose was made a region of special study, no one dreamed of improving upon Hunter's method of opening the antrum, which consisted in removing one of the molars and breaking down the thin layer of bone between the alveolus and the cavity above. Hunter, too, refers to the feasibility of making an opening from the nose into the antrum as an alternative procedure, though he does not dwell upon it even for the sake of indicating its disadvantages. These are chiefly the difficulty in the subsequent drainage; for the opening not being in the most dependent portion of the cavity, it becomes necessary to insert a drainage tube in the inner wall of the antrum, and wash out the latter as frequently as may be desirable. This the patient can never be entrusted to effect himself, so great are the inherent difficulties; on the contrary, the opening once made into the mouth, the whole of the subsequent washing and drainage are most satisfactorily conducted by the patient or a nurse. The only objection raised against Hunter's method is, that drainage being into the mouth, the patient is subject to this inconvenience, as well as there being some risk of particles of food entering the cavity. As a matter of fact, however, none of my patients have ever made this complaint. If, for any reason, it appear desirable to make a free opening into the nose, it should be effected from the inferior meatus, either with a knife, designed by Miculicz for the purpose,[1] or with the large-curved, strong

Hunter's method

German method

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[1] *Archiv. f. Klin. Chir.*, 1887.

trocar and cannula of Krause,[1] much like the instrument for opening the bladder from the rectum. The orifice made with this instrument is sufficiently large to remain open without a tube. For my own part, I open from the nose only as a help to diagnosis, using a strong curved hollow needle, to which a small exhausting syringe may be attached. This is most easily thrust through the outer wall of the nose immediately above the inferior turbinated, though it must be remembered that this brings the instrument in close proximity with the orbit. Other methods of securing evacuation of the antrum, by means of washing the cavity through the natural orifice, as recommended by Michel, or of opening the closed aperture by means of Pollitzer's air-douche, as practised by Hartmann, demand notice only for the sake of indicating their impracticability. Stoerk recommends the dilatation of the middle meatus with tampons of strongly compressed cotton-wool, after which he asserts that the entrance into the antrum can be seen as a purulent spot. The compression of itself assists the spontaneous evacuation of the cavity, and the pus may be further washed out through the natural opening.[2]

Operations from nose

It only remains to give some particulars of the more accepted method of draining the antrum. If the removal of a tooth or stump is necessary, the decision as to which can be best spared should be left entirely to the dentist. If, on the other hand, there is a vacant spot along the alveolar border, his assistance will not be required. With a gum-lancet a crucial incision is made down to the bone. With a

Operation from alveoli

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[1] *Berlin Klin. Woch.*, 1889, No. 37, p. 815; *Zur Therapie des Empyema antri Highmori*, von Dr. Alfred Friedlaender.

[2] *Wien Med. Wochenschrift*, No. 43, 1886.

gimlet-drill, which gives less pain than a perforator on the trocar-pattern, the antrum may then be opened with very slight discomfort to the patient. A fine

Washing

Eustachian catheter, with a syringe full of water attached, is next inserted into the orifice, and the cavity is washed out; the diagnosis is immediately verified by the stream of fœtid pus pouring from

Drainage

the nose. A piece of Ellis's drainage tube, about three-quarters of an inch long, and partly untwisted at the buccal extremity for a coil or two, to prevent the possibility of its receding into the cavity, is then inserted into the sinus and allowed to remain. The tube should be of a thickness to be self-retaining. In cases where it becomes necessary to retain it for any length of time, the dentist's assistance may be necessary to devise some pleasant means for the comfortable retention of the tube. As the smallest tube is not sufficiently large to admit the pus freely, acting rather as a means of keeping the sinus open than as actual drainage, it will require removal two or three times a day for the purpose of washing the antrum. This, after a few attempts, is generally effected with less discomfort by the patient himself than by the practitioner.

In the case of there being no diseased teeth, Mr. Christopher Heath recommends the puncture of the antrum from above the alveolus. He further insists upon the washing of the cavity with a powerful stream of water.[1] It might occasionally be of service to remember that the cavity of the antrum is sometimes divided, as pointed out by Giraldès, by septa of bone, and that consequently a first attempt at reaching the pus might be ineffectual.[2]

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[1] *Transac. Odont. Soc.*, November 1889, p. 38.

[2] *Des Maladies du Sinus Maxillaire*, Paris, 1857.

Empyema of the sphenoidal sinus

Empyema of the sphenoidal sinus and of the posterior ethmoidal cells are the only cavities of which no mention has been made. Affections of the former have occasionally been spoken of in the scattered literature of diseases of the nose; but, so far as I am aware, no information of any assistance to the student of the subject has been afforded either as to diagnosis or treatment.[1] While having a suspicion that these diseases are far more common than has been realised, I am yet unable to record more than two positive cases of pus in the sphenoidal sinus. Probably many cases of troublesome and otherwise unaccountable suppuration in the post-nasal cavity are due to inflammation in this region, especially as they are so rebellious to treatment. But, even given the diagnosis, the treatment is a matter that cannot be lightly undertaken if it is to consist in the opening and draining of a cavity having no constant delimitations, and lying in such close proximity with the cranial cavity.

Case illustrating sphenoidal suppuration

In the two cases where the appearances left no room for doubt that the pus proceeded from the sphenoidal sinus, the discharge flowed almost entirely into the post-nasal space. One patient was anæmic and suffering from collapse of the erectile tissue; consequently there was a strong tendency for the posterior wall of the naso-pharynx to be deprived of its moisture. Hence, as the pus slowly trickled into the cavity below, it became desiccated, and lay on the right side of the posterior wall as a thick crust. This accumulated in considerable quantities over the lower part, while, as the vault of the cavity was approached, it became slenderer and more fluid. Case Thence it could be traced as a thin yellow line into the nasal cavity, it being there directed upwards on to the anterior surface on the body of the sphenoid. This appearance was almost invariable, although occasionally the flow seemed to have ceased, so that nothing appeared but the inspissated mass below. Sometimes also the superior turbinated would be partly covered with the secretion, and even a little might be seen on the middle. This would be more likely to occur if the head were held forwards. If the patient was requested to sleep the whole of one night on his left side, on the following day the discharge would be found lying more on the left side, thus proving that its usual situation was the result of gravity. The pus was never seen coming from the left superior meatus. On examining the nose from the front, the anterior face of the sphenoidal sinus could be clearly seen with pus lying on it. So that in this case there could be no question as to the origin of the discharge. The evacuation of the pus and cure of the patient substantiated the diagnosis (see Case 46).

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[1] Dr. A. Bronner, of Bradford, has recently (*Med. Press and Circ.*, April 1888) described a case where, with a thick probe, he detected rough bone above and behind the middle turbinated bone. With a sharp spoon passed in this direction he scraped the sphenoidal cavity and cured the patient of an offensive discharge. But the information he gives concerning this very interesting case is scarcely sufficient to be of much assistance in future diagnosis.

In the other case there had been a constant discharge of offensive blood and pus into the post-nasal cavity for fifteen years. The whole of the left sphenoidal cavity was found lined with bare bone.

Treatment

Given the diagnosis of sphenoidal abscess, theoretically there should be no difficulty in evacuating the

Opening the sphenoidal sinus

cavity. If it is remembered that the anterior surface of the sinus looks downwards and forwards into the nose, immediately above the superior margin of the opening into the post-nasal space, an instrument could be easily thrust in this direction and the wall punctured (Fig. 47). Carrying our instrument upwards and backwards in a line with the union of the vomer with the perpendicular plate of the ethmoid, it should impinge directly on to the sphenoidal sinus. But where a view of the anterior wall of this cavity can be obtained, this indication will not be necessary. The great difficulty, however, lies in our ignorance as to the state of development of the cavity in any individual case, and there might be considerable difficulty in reaching a small sinus embedded in a large quantity of cancellous bone-tissue. In such a region none would be foolhardy enough to persist in making a series of attempts after one failure. Hence the utmost caution must be enjoined even in the most unequivocal cases. It must be remembered also that sometimes there is only one cavity extending across both sides; that occasionally there is an opening on one side alone; and that sometimes the cavity may be altogether undeveloped.

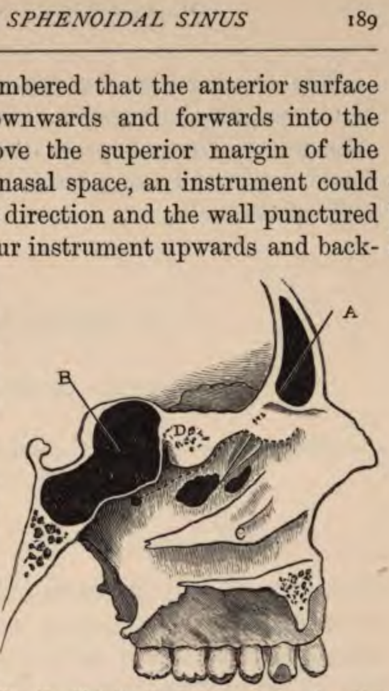

FIG. 47.—Showing the relation of the sphenoidal sinus to the nasal fossæ. A shows a probe passing from the frontal sinus along the infundibulum and pointing to the *ostium maxillare*; B, the sphenoidal sinus; C, the inferior turbinated; D, the superior. The dotted line indicates the attachment of the middle spongy bone.

The opening into the posterior ethmoidal cells is of course quite inaccessible. But in a case where the diagnosis is clear, a probe thrust in their direction would easily and safely break down some of the thin walls of the cells.

CHAPTER X

AFFECTIONS OF THE SEPTUM

1. Deflections, Ecchondroses, and Exostoses. 2. Abscess and Hyperplasiæ.

1. *Deflections, Ecchondroses, and Exostoses.*

Frequency of aberration from the normal

LIKE other hypertrophic affections of the nose, not due directly to inflammatory action, deflections and thickenings of the septum have given rise to much discussion as to their nature. So common are they in the form of ecchondrosis and exostosis that one would be justified in considering them normal conditions, if only there were any uniformity in their configuration. But in view of the extraordinary contortions into which they so frequently develop — even, as often happens, without the production of any subjective symptoms—we are inevitably convinced that they are departures from a state of normal anatomy. When, moreover, we find grave symptoms sometimes induced—which symptoms are to be removed only by correcting in some measure the deformity in question—no further doubts can be entertained as to the propriety of discussing them among other diseases of the nose. To give an idea of the remarkable prevalence of deflections of the septum, Sir Morell Mackenzie examined 2152 skulls with the bony septum entire in the Royal College of Surgeons. Of these, 76·9 per cent presented more or less deviation; 38·9 per cent to the left side, 28·3 per cent to the right, while in the remainder it was irregular.[1] When, moreover, it is remembered that the majority of cases, as seen in the out-patient room, present the deflection chiefly confined to the triangular cartilage, we see that the percentage must be even larger than that given above. The same investigator showed that of 438 examples of symmetrical septa, only 22·6 per cent were Europeans, the rest being drawn from Africans and other aborigines of a lower type. Zuckerkandl's observations on this point are almost identical.[2]

Statistics

Ætiology

The ætiology of the diseases present several difficulties in their satisfactory elucidation. In the first place, it may be taken for granted that the affections are not inflammatory in their nature, seeing that the hypertrophied portions show no indications of inflammatory changes when examined microscopically. Next, in the majority of cases there is no evidence, objective or subjective, of present or past inflammation; while, considering that the vast majority give rise to no symptoms whatever, they can hardly be discussed, at any rate from the patient's point of view, as the products of disease. Nevertheless we meet with a certain number of cases where ecchondroses and exostoses of the septum, if not themselves the consequences of disease, must yet be admitted to be the cause of serious symptoms, subjective as well as objective.

Majority give rise to no symptoms

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[1] *Diseases of the Throat and Nose*, vol. ii. p. 433.

[2] *Anatomie der Nasenhöhle*, Wien, 1882, p. 44.

And to any one sceptical upon this point we may quote the axiom, "Naturam morborum ostendunt curationes."

In the absence of precise knowledge in the matter, it will be well to quote the views of some whose opinions on any subject are worthy attention. Some claim that deflections of the septum are congenital; but this is at once answered by the investigations of Zuckerkandl,[1] who asserts that it never occurs before the age of seven years. Clinical observation, moreover, entirely endorses this statement. Sir Morell Mackenzie suggests "that the deflection may result from the fact that ossification of the septum proceeds from centres situated in two different bones, and that these deposits of ossific matter do not subsequently meet in the same plane."[2] And probably some such law of development may be responsible for those cases where the osseous portion is the seat of the deviation. Yet it hardly elucidates the more common variety, where the deflection is almost confined to the triangular cartilage. With the V-shaped superior maxilla, and in general where there is a conspicuously high palate, there is usually found a deflection of the septum to the left side. From which one would infer that the septum, being hindered in its vertical growth by the elevation of the hard palate, becomes deflected to one side.

Theories

Association with high palate

The great difficulty experienced in investigating the ætiology arises from the fact that there being in the majority of cases no symptoms, or the symptoms being only of recent development, there can be no history. Where the patient is conscious of obstruction in one side of the nose, the trouble is not

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[1] *Loc. cit.*

Loc. cit.

Traumatism

Men oftener affected than women

infrequently dated from a severe blow or fall on the face. This, coupled with the fact that men are three or four times as frequently affected as women, and that boys are more liable to blows in this region than girls, indicates very strongly the possibility of a traumatic element oftener than is usually supposed. I have noticed, moreover, that women more frequently than men admit the history of a bad blow, as if, the event being comparatively rare among the former, they took more notice of it; while, with men, the usual answer to the interrogation is that they had an average amount of knocking about the face at school. In these cases it is but necessary to assume a fracture of the cartilage to account for all the appearances. Thus, as in the case of bone-fractures, the amount of callus thrown out will be inversely proportionate to the angle of deviation from the straight line—a ratio which, as a matter of fact, we find almost invariably subsisting when the cases come under observation many years after. Generally speaking, the sharper the angle of deviation, the greater is the amount of cartilage thrown out to support it. We need but to infer that the callus becomes gradually indistinguishable histologically from the structure it supports, as is the case with fractured bone, and we have the condition under discussion. Traumatic cases are, for the most part, confined to the anterior portion of the triangular cartilage.

Fracture

But many instances occur in which there is positively no history of traumatism, and where there is no contraction of or undue altitude of the hard palate. Two patients of mine, both medical men, assured me that they had watched the obstruction growing during periods of eighteen months and two years respectively, ecchondroses of the septum being solely responsible for the stenosis. In both of these, as in many others, there was a general condition of chronic rhinitis. So that we are compelled to inquire further for the ætiology of such cases as these.

Chronic rhinitis

Once more I must refer to the physical conditions which lead to hypertrophy in the nose, as detailed in Chapter I. The lowered barometric pressure behind the seat of a temporary or permanent nasal stenosis, inevitably present during nasal inspiration, leads perforce to overfilling of the blood-vessels, and thus to hypernutrition. Hence we can readily account for any increase in thickness of the septal structures. This hypernutrition leads to a deposition of cartilage in the perichondrium, and also to increased blood-supply within the cartilage and bone themselves; so that there will be a tendency to overgrowth in the vertical as well as in the horizontal direction. Now, seeing that vertically the septum lies between fixed limits, any increase in this direction must result in its being bowed to one side or the other. Indeed, as in the cases of supposed fracture, the thickness is greatest where the bending is most conspicuous; in other words, hypernutrition at a given spot produces thickening in one diameter and bending in the other, because in that there is no room for elongation. Chassaignac[1] has pointed out the fact that, given a tendency to increase of growth in the vertical direction, and granted that the septum lies between fixed bony limits, the structure of necessity bulges into one or the other nasal fossa.

Physical conditions may lead to hypertrophy

Of one hundred of my own cases in which hypertrophy or deflection of the septum was causing serious

Author's statistics

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[1] *Bulletin de la Soc. de Chir.*, 1851-52, vol. ii. p. 253.

interference with the functions of the nose, eighty-four were in men, and only sixteen in women. Of the eighty-four males, four only were simple deflections without material thickening, while eight had symmetrical thickening on each side without any material deviation. Of the remaining seventy-two cases, in forty the hypertrophies occurred on the left side, and twenty on the right, while twelve were of the mixed form called sigmoid — that is to say, where a vertical section of the septum would present a figure of S, the convex points being, moreover, greatly increased in thickness. Of the sixteen cases in females, in nine the ecchondroses were to the left side, and seven on the right.

Subjective symptoms

In well-marked cases there is often some deformity of the external portion of the nose. In consequence of an antero-posterior elongation of the septum as well as a vertical, we often find the point of the nose turned to the side opposite from that affected. But in the most marked cases of this external deformity the ecchondrosis is pressing so forcibly upon the outer wall that the nose is driven to the opposite side. That this is actually the case is proved by the remarkable manner in which the point of the nose will regain the middle line after removal of the tumour. This I have witnessed in a large number of cases. But even when the obstruction is so pronounced as this, there may be absolutely no symptom calling for treatment of the obstruction. Yet in many others, even when the degree of stenosis is very small, the deviation or hypertrophy of the septum may be productive of every symptom usually resulting from the various forms of nasal obstruction. As direct consequences of the pressure we may have a purulent discharge,

External deformity

epistaxis,[1] and neuralgic pains on the same side of the head. From the direct irritation of the neoplasm we often have sneezing and rhinorrhœa, sometimes preceding an attack of so-called spasmodic asthma; while there may be lachrymation on the same side. In these patients often the slightest breath of cool air or change of temperature is sufficient to bring the mucous membrane of the opposite walls in contact and thus induce the train of symptoms. Such patients frequently seek advice for the hay fever, from which they say they are sufferers. In one of my worst cases there was well-marked obstruction of the *ostium maxillare*, the sinus at intervals of three months or so discharging a quantity of canary-coloured, transparent fluid, obviously non-purulent, though offensive. It is now over a twelvemonth since the obstruction was removed, and there has been no return of the flux. As a consequence of the occlusion of one side, the other nasal fossa is compelled to do all the work of warming, moistening, and filtering the air. In some cases the patient adopts in consequence a partial buccal mode of breathing, and the pharynx and larynx naturally suffer. I have observed many instances of chronic laryngitis where symptoms, such as dysphonia, voice-fatigue, etc., were entirely remedied by removing an ecchondrosis or exostosis of the septum. These cases have occurred more especially where the opposite side of the nose was abnormally wide in consequence of the septum being concave and the fossa correspondingly widened. When this is the case, the wider side generally shows a strong tendency to simple rhinitis sicca, which further increases the liability to pharyngeal and laryngeal inflammation.

Reflexes

Obstruction of *ostium maxillare*

Rhinitis sicca

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[1] See Case quoted by Sir Morell Mackenzie in *Diseases of the Throat and Nose*, vol. ii. p. 434.

Objective examination

On making a rhinoscopic examination we are at once acquainted with the true nature of the obstruction. We see a ridge running in an antero-posterior direction on a level with the junction of the vomer with the perpendicular plate of the ethmoid for about half the distance into the nasal fossa. Usually the farther back the more prominent it becomes, though many cases are seen where the chief obstruction is in the anterior portion. Less frequently a single spur is observed projecting conically from the septum. These latter are most often exostoses, and as a rule project from the osseous portions of the septum. Not infrequently, however, the outgrowth from the triangular cartilage becomes ossified, and sometimes with an extraordinary density, occasionally even in young people. Usually opposite the ridge we discover more or less of a concavity on the opposite side, though not very seldom we find a symmetrical projection on each side. Rarely synechiæ, sometimes congenital, are observed between the ecchondrosis and the inferior turbinated body, occasionally to a remarkable extent. In one of my cases, in which there were positively no symptoms traceable to the condition, fully three-fourths of the inferior spongy body were so affected, cicatricial-like bands extending across the adhesion, above and below. Sometimes, again, an ecchondrosis is observed on one side above, and another lower down on the other side, slight concavities in these cases generally corresponding with the exaggerated convexities. This is the so-called sigmoid form. A very unusual variety is the vertical ridge. This involves only the cartilaginous portion of the septum, and may cause very considerable obstruction.

Ossification of the cartilage

Synechiæ

The turbinated bodies of one side may be seriously

Condition of turbinated bodies

encroached upon, while on the other one of two conditions is generally found—either a dryness of the membrane with thin blackish crusts of mucus adhering to the septum, to the middle, and rarely to the inferior turbinated bodies, sometimes with a superficial excoriation of the anterior part of the septum, but probably never a perforation; or a true hypertrophy and engorgement of the inferior turbinated body. The latter would appear to be a physiological attempt to compensate for the abnormal width of the fossa, and should not be lightly interfered with. It is exceedingly rare to find any deviation or hypertrophy of that portion of the septum exposed in posterior rhinoscopy. It occurred in none of the numbers quoted above.

Pathology

There is but little to be said concerning the pathology of these affections beyond what will already have been gathered under the head of Ætiology. I have never seen any evidence of inflammatory action in the microscopical structure of these growths, though perhaps inflammation is responsible for the adhesions between the neoplasm and the inferior turbinated. The growths, when proceeding from the osseous portion of the septum, are sometimes almost entirely cartilaginous in their structure, or they may consist of bone, either cancellous or possessing an almost ivory density. Those growths projecting from the triangular cartilage are usually homologous, although here also they may become ossified, the bone sometimes assuming a remarkable degree of compactness. The more frequent site of the hypertrophies and deviations of the septum is at the line where the vomer articulates with the perpendicular plate of the ethmoid and the triangular cartilage respectively. It is from some point in this line also that the rounded conical spurs project. The perpendicular ridges I have seen involving only the triangular cartilage. The sigmoid form is mostly confined to the triangular cartilage, though we not infrequently observe it to a less degree in the dry specimen. Simple deviation, without material thickening, also is almost confined to the cartilaginous portion of the septum; and I have but once or twice seen it involving the bony portions to such an extent as to necessitate treatment.

Prognosis

Good in selected cases

In those cases where the symptoms obviously point to an ecchondrosis or exostosis of the septum being the direct or indirect cause, the results of treatment are highly satisfactory. Where unrelieved by art, many cases doubtless tend to deteriorate and the symptoms to become aggravated. I have watched these neoplasms distinctly increase in size in the space of a few months in more than one case. On the other hand, there is obviously no tendency to spontaneous amelioration. Yet, although the enlargement of the septum may be in part directly responsible for the production of the symptoms, an equal share may be borne by some form of chronic rhinitis, inducing a swelling of the inferior turbinated body; the two conditions together being responsible for the mutual irritation of the surfaces which is directly provocative of the reflex phenomena. In this way the spontaneous or other recovery from chronic rhinitis may be sufficient to remove symptoms for which the ecchondrosis had been held responsible. It is necessary to indicate this possibility while speaking of prognosis, in order to forestall the danger of error.

These remarks on prognosis lead one directly to words of warning as preface to a description of the various modes of treatment. It is undoubtedly bad

Caution against unnecessary operation

surgery to hold that every departure from the right line in the position of the septum demands treatment. It is probably equally faulty to assume that surgical means must be adopted even when one nasal fossa is completely occluded. As has been insisted upon before, innumerable individuals tolerate partial or even complete nasal obstruction without any inconvenience whatever. It is only when actual symptoms are produced in consequence of pressure on contiguous surfaces or interference with nasal respiration that operation is demanded. Whenever, for instance, there is a chronic laryngitis, with enough nasal stenosis to cause even a partial buccal respiration ; whenever there is paroxysmal sneezing or hay fever, even although there be no interference with nose breathing ; whenever there is post-nasal catarrh or Eustachian occlusion ; whenever there is dry rhinitis of the pervious fossa ; whenever there are, together with stenosis of one side, trigeminal neuralgia, epiphora, or much external deformity, we may with perfect propriety, and with the best hope of success, remove the offending mass. It is the neglect of such considerations as these that justly brings specialism into disrepute ; but fortunately for many patients the nose is singularly forgiving of ill-usage, and when unnecessary operations are undertaken, it is only the reputation of the profession that usually bears the brunt.

Operations

Bosworth's

There are several methods of removing ecchondroses and exostoses of the septum. The simplest, which is applicable to almost all cases, is that devised by Bosworth of New York. It consists in cutting off with a saw, specially constructed for the purpose (Fig. 48), the protruding growth, whether osseous or cartilaginous, together with its covering of mucous membrane.

The saws are two in number—one cutting upwards, and the other downwards. The steel portion is about eleven centimetres long, the anterior half being serrated and probe-pointed, while the other carries a large wooden handle at the proper nasal angle. By this means the hand is kept away from the field of vision during the operation. The mucous membrane having been well cocainised with a 20 per cent solution soaked in a tampon of cotton-wool, the saw is introduced either above or below the protrusion, as may appear more convenient, and rapidly cut through. The bleeding is sometimes very profuse, though it generally ceases as soon as the operation is completed. Occasionally the nose may need plugging. When the growth is densely ossified, as sometimes occurs even when attached to the cartilaginous septum, it may not be possible to complete the operation before the cocaine has lost its effect; it is, moreover, generally useless to reapply the anæsthetic after hæmorrhage has begun. In the view of this possibility, I consider it preferable to operate under a general anæsthetic: nitrous oxide, with a little ether, generally meets the requirements of the case; while if the anæsthesia is not sufficiently prolonged, it can be re-induced. The only objection to this very simple operation is found in the

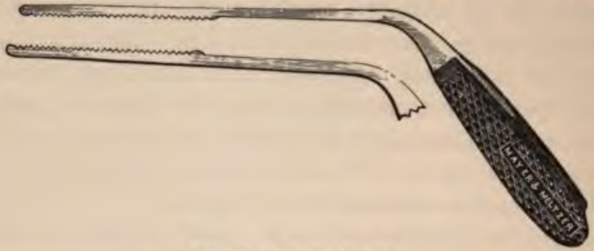

FIG. 48.—Bosworth's saws.

Nitrous oxide sometimes necessary

case of large growths, when there is some danger of the patient subsequently suffering from the substitution of a dry cicatrix for the normal secreting membrane. Where there is already a tendency to dry rhinitis, even if of the other fossa, the operation is decidedly objectionable. For Bosworth's I have consequently substituted an operation, in every way as efficient, but in which there is no destruction of the mucous membrane. The method is as follows:—A single linear incision is made over the most prominent point of the neoplasm well down to the cartilage. With a raspatory (Fig. 49) the perichondrium, with its inseparable mucous membrane, is then turned up and down sufficiently to expose the portion to be removed. Next, the superabundant cartilage is separated with a gouge or saw if it prove to be ossified. Finally, the flaps are allowed to fall together, the wound is dressed with iodoform, and a small tampon of cotton-wool, impregnated with some antiseptic, is inserted so as to exert a gentle pressure upon the flaps and assist in retaining them in their position. Healing frequently takes place by first intention. Besides being useful in the cases mentioned, this is the only possible operation for vertical ridges attached to the triangular cartilage, seeing that, from their position, the saw is very difficult to apply. For these cases I have devised special instruments (Figs. 49, 50, and 51). The knife must carry the edge at its extremity, which is turned at right angles to the stem, so as to make an incision from above downwards. The raspatory must describe the quad-

Author's operation

No loss of mucous membrane

Instruments

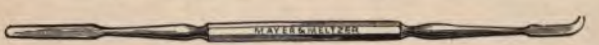

FIG. 49.—The author's raspatory.

rant of a circle, the blade being three-fourths of an inch or so in length, so that the farther flap may be pushed up, away from the operator, and the near one pulled up towards him. The cutting edges of the gouges are also turned at right angles to the stem, so as to permit of inserting the instrument at the upper limit of the ridge, and of cutting it away in a downward direction. A separate instrument is needed for each side. These instruments have been ingeniously made for me by Messrs. Mayer and Meltzer, all fitting into one handle. Two forms of gouge for antero-posterior operations are found convenient, one having a rounded and the other an angular edge.

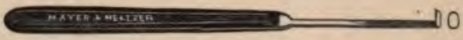

FIG. 50.—The author's knife for incising the muco-perichondrium over vertical ridges.

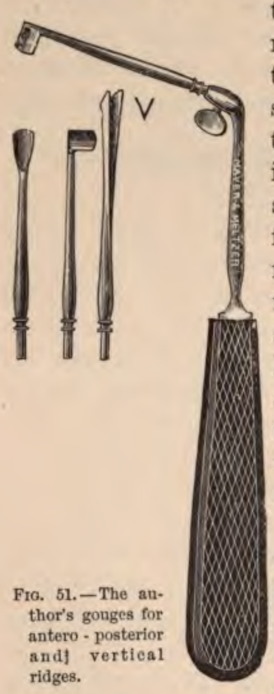

FIG. 51.—The author's gouges for antero-posterior and vertical ridges.

After operating in this manner there is sometimes a slight amount of sloughing at the margins of the flaps; but the total result in every case is a great saving of the valuable mucous membrane. The great trouble during the operation is the hæmorrhage, which, though seldom really profuse, is enough to obscure the seat of operation during the latter stages; and it is sometimes necessary to wait

Hæmorrhage

till the bleeding from the incision has ceased before it is easy to pare away the superfluous cartilage. If the operation is being conducted under cocaine, the length of time is serious, while the necessity of occasionally washing out the nose makes a general anæsthetic undesirable unless we plug the posterior nares; and this alone has its inconveniences. Altogether, considering the slight importance of the operation, I think cocaine is the anæsthetic to be preferred.

After-treatment

The only difficulty in the course of the subsequent treatment is the tendency of all wounds in the nose, as previously mentioned, to produce fungating and œdematous granulations; these might possibly prevent the cicatrisation indefinitely. Consequently the patient must remain under observation until the surface is completely healed. The nose ought to be carefully washed out and dressed with antiseptics until granulation is established, after which the patient may be entrusted to effect the necessary cleansing himself.

Trephining

In cases where a small ridge is running from before backwards, and the mucous membrane is secreting a sufficient quantity, we may very conveniently and rapidly remove the superabundant tissue with a small trephine, driven by a small electro-motor. That made by the Dental Manufacturing Company is the simplest and smallest (Fig. 52). It requires an E. M. F. of 6-8 volts, though even less is sufficient. It is best employed with a rheostat, by which the motion may not only be started at will, but its speed very easily regulated with the foot. A flexible arm and hand-piece, such as used with the dental engine, are necessary. The trephines should measure about half a centimetre in diameter, more or less, according to the case. In removing larger growths the trephine is not so applicable, as the surface is apt to be very irregular when healing is completed. In removing small dense exostoses situated far back, the trephine is very serviceable.

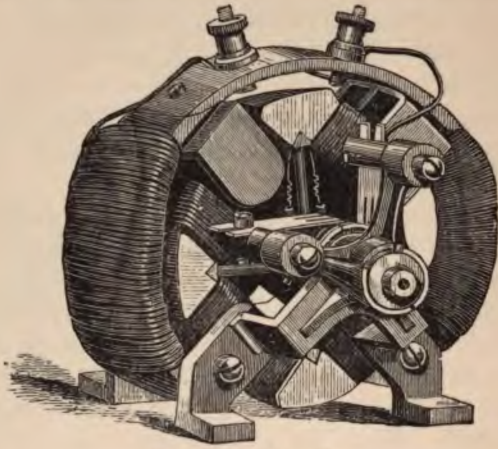

FIG. 52.—Electro-motor.

All attempts at forcible straightening of deviations futile

Sometimes in dealing with a simple deflection of the septum sufficiently large to occlude one fossa, but without much thickening of the walls, we may be in some doubt as to the proper course to pursue. If we consider the fact that a curved line is necessarily longer than a straight one lying between the same limits, and that these limits in the case of the septum are fixed, it is obvious that any attempt to rectify such curvature by forcible straightening is mathematically absurd. Hence the employment of Adams's forceps (Fig. 53), and plugs for this purpose must be useless. They were originally designed by that distinguished surgeon for rectifying fractures, and not

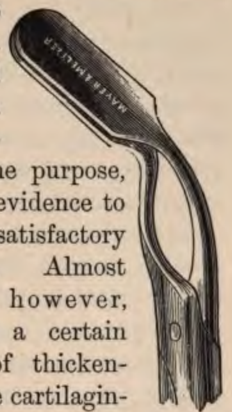

FIG. 53.—Adams's forceps.

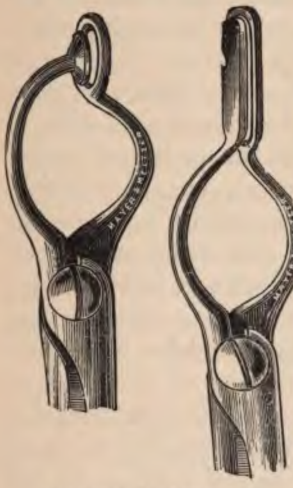

FIG. 54.—T. Smith's forceps.

for the cases in question. Mr. T. Smith's forceps (Fig. 54) would be more correct upon theoretical grounds, seeing that they aim at fracturing the projecting portion through the larger fenestrated blade; but they have failed in my hands. Innumerable other forceps have been invented for the same purpose, the very number of them bearing evidence to their unsatisfactory operation. Almost always, however, there is a certain amount of thickening in the cartilaginous septum, the paring down of which will generally prove sufficient for the removal of the symptoms. Should there not be sufficient material for this, no objection can be raised to cutting off enough of the projecting angle with the saw, although we thereby make an opening into the other side. From such a procedure there is no risk of subsequent deformity to the nose. Indeed, one not infrequently sees almost the whole of the triangular cartilage destroyed by syphilis without any external indication of the fact. It is only when the bony supports or the alæ themselves are attacked that there follows any deformity. So that I believe one should be reluctant to interfere

Treatment of simple deviation

with the osseous septum in the manner advocated. One occasionally sees an opening made from one side to the other through the anterior part of the deflection, thus giving access to one nasal fossa from both nostrils. Yet, although the procedure was first advocated by Billroth,[1] the advantage of this procedure is not very apparent, seeing that the occluded fossa remains in the same predicament as before. But the suggestion made by Mr. George Stoker of trephining one opening through the anterior wall of the deflection and another through the posterior wall is thoroughly scientific; but of its practical utility I have no experience.[2]

Other measures

Tampons of cotton-wool, laminaria-tents, and other such remedies are obviously, for the reasons cited, of no use. In one of my patients the prolonged use of such remedies over a period of six months not only gave him a serious amount of unnecessary suffering, but even, judging from his own account, made matters considerably worse. Digital rectification, as recommended by some authorities, falls under the same condemnation.

The American specialists claim to have some success in the treatment of deviations of the septum. The principle usually adopted is to incise the triangular cartilage from before backwards, or crucially, so as to facilitate the fracture of the osseous portions of the septum with forceps. Various instruments have been designed for making the preliminary incisions, most of them being in the form of forceps. Steele's is that most generally employed. It makes six radiating incisions at the most prominent point; but it is objected to by Jarvis on account of the frequent sloughing at the centre. Consequently he has designed a similar instrument which leaves the centre of the incision intact. After the septum has been fractured, some form of splint is inserted to keep the new position. Dr. Asch recommends a triangular piece of tin wrapped round with absorbent wool moistened with a solution of perchloride of mercury (1 in 5000). This is packed in its place with a tampon of gauze or wool moistened with the same solution, the splint and packing not to be disturbed for four days. Dr. Langmaid insists that the septum must be so effectually fractured that it will retain its new position without any splint, else the operation will prove a failure; while in lieu of a splint he recommends a black-rubber nipple plug stuffed with cotton. For my own part I am inclined to agree with Dr. Jarvis that orthopœdic appliances are out of place in intra-nasal surgery, especially as I have never yet met with a case in which the perviousness of the fossa could not be sufficiently restored by cutting away with trephine or saw the thickened ridge which almost invariably accompanies the deviation.[1]

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[1] *Clin. Surg.*, New Syd. Soc., 1881, p. 77.

[2] *Deviations of the Nasal Septum*, 1888.

2. *Abscess and Hyperplasiæ of the Septum.*

Of inflammatory affections of the septum there are only two that have not been already discussed; these are abscess hyperplasiæ and œdema of the septum. **Abscess** The former is by no means of frequent occurrence. It usually follows a blow on the nose, with extensive ecchymosis, or even with the formation of a hæmatoma of the triangular cartilage. Sir Morell Mackenzie relates a case where the affection followed an attack of typhoid **Ætiology** fever. When the result of injury, there is probably

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[1] For an interesting discussion on this subject, see *Transactions of the American Laryng. Ass.*, 1890 p. 76 *et seq.*

Symptoms always some external evidence of the fact: the nose is red and swollen, the eyes are ecchymosed, there is lachrymation and swelling of the upper lip. The patient complains that his nose is stopped up; and, although it is running freely, that he cannot blow it properly. On examining the interior of the nose, the entrance to the fossæ is found blocked by a tense, pinkish or purplish shining tumour, which, on probing, is found to fluctuate distinctly. There is usually a symmetrical abscess on each side of the triangular cartilage; the margin of the abscess may or may not be sharply defined. Such cases probably often undergo spontaneous cure, being responsible perhaps for some cases of perforation of the triangular cartilage; for, when both sides of the septum are simultaneously involved, necrosis of the intervening cartilage must, in all probability, result. Sometimes chronic The abscess is sometimes chronic; in this case, according to the last-named authority, they present a lighter colour, are less painful, and are accompanied by little or no constitutional disturbance. I have seen one case where the abscess, dusky in colour, occurred in the course of tertiary syphilis, and was probably due to the breaking down of a gumma, as it was followed by no exfoliation of cartilage.

Diagnosis The only condition for which chronic abscess of the septum could possibly be mistaken is that to be immediately described, viz. a hyperplasia of the mucous membrane, which, as will be seen, frequently gives to the probe an impression of fluctuation. It might also be possible to mistake an engorgement of the erectile tissue, situated on the lower part of the septum, for abscess, as both yield a similar impression to the probe. A recollection of the anatomical fact will most probably suffice for eliminating error; though, if there be any doubt, the application of a little cocaine will satisfactorily establish the diagnosis by causing a rapid shrinking of the erectile tissue.

Prognosis

No fear need be entertained that abscess in this region, by leading to necrosis, will endanger the external configuration of the nose. The most extensive perforation of the triangular cartilage, as has already been remarked, never leads to deformity, provided the anterior margins are left intact and the osseous support is not involved.

Treatment

The treatment of abscess of the septum consists in the evacuation of the pus and the establishment of free drainage. Asepticism in the nose is an impossible achievement.

Hyperplasia of septum

Chronic inflammation in the nose, while it often leads, as has been shown, to the development of mucous polypus growing from the osseous structures, similarly may lead to a condition of hyperplasia of the mucous membrane covering the triangular cartilage. For some rather obscure reason this hyperplasia does not exhibit the same tendency to become œdematous that is found in the case of the flaps of overgrown mucous membrane when attached to the middle turbinated body. The condition is by no means common, and I can recall only four cases. With each of these, however, the main trouble was polypus. In three of them the nose was completely occluded with the growths, and in each of these the hyperplasia of the septal mucosa was unilateral. In the fourth case it was quite as conspicuous on both sides, though there were only two or three small polypi attached to the middle spongy bone.

Associated with polypus

Symptoms

There are no subjective symptoms that can be dissociated from those due to the graver concomitant causes of obstruction. Objectively, these inflammatory

Objective growths are seen high up in the vestibule of the nose, filling up the space between the anterior wall and the anterior extremity of the middle turbinated. They are smooth, rounded, ill-defined structures, of a dusky red, solid aspect. Their surface appears uniform and smooth, though, after removal, they may be found to present rugæ or ill-defined mammillations. To the probe they give an impression of fluctuation very similar to that afforded by the turgid erectile tissue. This is the more remarkable, since microscopical examination proves them to be comparatively substantial. The base of attachment was in three of the cases ill-defined; but in the fourth it was distinctly contracted, so that the body could be moved about with the probe. It is probably such cases as this that have been described as polypus attached to the septum.

Diagnosis The only possible conditions for which these growths can be mistaken are abscess of the septum, the diagnosis of which has immediately been considered; and, in the event of their lying in very close proximity with the middle turbinated, hypertrophied mucous membrane attached to this body. Judicious use of the probe will effect a satisfactory conclusion. The use of cocaine will distinguish between vascular turgescence and the hypertrophy in question.

Pathology The reason for declining to consider them as polypi rests in the fact that they lack the essential structural feature of that formation: they are absolutely devoid of any appearance of œdema. They are essentially hypertrophied mucous membrane, showing all the characteristic features possessed by that structure in the nose. The only departure from a condition of health is found in the enormous development of small round cells, which we may consider lymphoid or

Cannot be considered as polypi

inflammatory according to our fancy, the increase of vascularity, with some very large sinuses, and the multiplication of the tubular glands. Yet, clinically and ætiologically, there is no very clear reason for not regarding them as identical with their associates. Their structure and clinical relation with polypus endorse the view that the latter is but a special development of inflammatory productions.

Œdema of septum

Simple œdema of the mucous membrane of the septum has previously been alluded to as a symptom of chronic rhinitis assuming a hypertrophic or hyperplastic form; that is to say, with either enlargement of the erectile tissue or polypus in its many forms. This œdema is most conspicuous posteriorly, and may assume very grave proportions. A gray or pinkish translucent swelling is observed symmetrically situated on each side of the septum, sometimes large enough to encroach upon the turbinated bodies. In old-standing cases there may be some actual hypertrophy of the œdematous tissue, so that cocaine will not enforce its disappearance.

Treatment

I have attempted on three cases to diminish the size of the hyperplasiæ by free incisions in the manner mentioned in connection with vascular engorgement of the inferior turbinated body, but without any success. The rational treatment is their removal with the snare—Jarvis's in preference to Mackenzie's, seeing that they bleed rather freely if the snare is cut through too rapidly. I have in one case observed a tendency to recurrence.

The treatment of posterior œdema of the septum consists in free cauterising with a guarded burner (Fig. 40, B), the instrument being guided into position with the help of the post-rhinal mirror.

CHAPTER XI

THE NASAL NEUROSES

1. The Physiological Reflexes. Nasal Asthma and Epilepsy. 2. Hay Fever and Paroxysmal Sneezing. 3. Idiopathic Rhinorrhœa.

1. *The Physiological Reflexes.*

IN discussing the subject of the symptoms or diseases arising from a reflex-irritation originating in the nose, we come into a region where it is very difficult to steer clear of the innumerable theories and fancies that have troubled the minds of rhinologists during the last few years since Daly, Roe, etc., of America, and Hack, of Freiburg, revived a controversy started by Voltolini in 1871. The clinical observations recorded by these gentlemen are open to the most respectful consideration; for many similar experiences must have occurred to any one having opportunity of encountering them. Hack, indeed, surpassed all other observers in the multitude of affections which he traced to disease of the nasal mucous membrane, though few have endorsed his theoretical pathology with their clinical observations. In the following remarks it will be attempted to avoid, as far as possible, irrelevant

History

theories, inquiring merely into such physiological bearings as may prove of any assistance, examining closely all clinical facts, and basing upon these any deductions that it may be necessary to draw.

Physiological reflexes

Certain physiological reflex-actions are commonly known to occur as the immediate result of irritation of the healthy nasal mucous membrane. These are, briefly speaking, sneezing, cough, and lachrymation, deglutition being only exceptionally observed. To a certain extent the regions to which such phenomena belong are correlated—that is to say, some forms of irritation of the conjunctiva, such as bright sunlight, may produce sneezing, or a foreign body in the larynx, besides cough, may also induce a flow of tears; while a bitter placed well on the back of the tongue, in some individuals, may produce sneezing and lachrymation. Such points vary considerably in different subjects—a point of some importance in considering the remarkable symptoms of the so-called hay fever. Into the precise course of the reflex-action in these different cases it is unnecessary to inquire; yet it may prove of some assistance to investigate the purpose, if any, served by these physiological reflexes, as well as some of their methods of excitation.

Their method of excitation

In a case where the physiological reflexes are apparently in a normal condition of intensity, it would appear that irritation of the anterior parts of the nasal fossæ by any mechanical means may produce the reflexes of sneezing, lachrymation, and rhinorrhœa. Of this neighbourhood the membrane lining the anterior wall of the fossæ above the vestibule is generally the most sensitive. Only slightly less sensitive is the corresponding portion of the septum; while distinctly less provocative of these reflex-phenomena are the anterior extremities of the middle and inferior turbinated bodies. Nevertheless the latter, together with any portion of the interior of the nose, are of course fully competent to produce the sneezing, etc., if sufficiently irritated. Passing backwards the septum still appears to be the most sensitive region; but as the posterior parts are approached the character of the reflex-action changes. As the tendency to sneeze becomes less, that to cough takes its place. This is especially seen when the posterior ends of the inferior turbinated and the region of the Eustachian tubes are irritated. The cough thus produced is hard, hollow, and, as the patient says, irritating, the sensation being referred to the neighbourhood of the larynx and trachea. Occasionally, when there is prolonged irritation in this region, the act of deglutition is also excited in addition to the cough. But I have never seen any other evidences of reflex-action than those enumerated. Consequently the question naturally suggests itself, Why, in conditions of disease, should we find reflex-effects produced which cannot be provoked by physiological means? Are we to assume that paths along which reflex-actions take their course exist in pathological states, though unknown in conditions of health? This is a question which, in the present state of our knowledge, it is impossible to answer. But clinical facts, so far as I have observed them, appear distinctly to point to the fact that those affections, which are obviously due to reflex-action instigated in the nasal mucous membrane, merely proclaim the fact that the nerve-endings are abnormally irritable, and thus too prone to induce the physiological consequences of their stimulation: in other words, we find such symptoms as sneezing, lachrymation, coughing, and perhaps deglutition, though

Do pathological reflexes exist?

Evidence of clinical facts

physiological in themselves, yet excited by conditions which must be considered pathological; while it is probable, judging from clinical observation, that no amount of pathological irritation will give rise to any symptoms beyond these, except perhaps in some rare cases of epilepsy where pathological conditions of the nerve-centres must be presumed to exist.

It may be claimed that the reflex-actions, said to be produced by pathological irritation of the mucous membrane, may be after all but exceptional expression of physiological fact. But the point I would maintain is that, whereas physiological reflexes are for the most part productive of some utility, such symptoms as those claimed by Hack, etc., to arise from nasal irritation, are obviously harmful to the economy. Again, it may be doubted whether the physiological reflexes can be considered as in any way beneficial. Sneezing, it may be argued, is not of any use in driving the irritating particles from the nose, seeing that it consists essentially in a closing of the palate during spasmodic expiration, and thus prevents the current of air from passing through the nose. But we probably find a correct explanation of the phenomenon in the following considerations:—On the entrance of an irritating particle into the nose, the primary object of the reflex-phenomenon is to increase the flow of mucus, not only for the sake of interposing some non-irritating substance between the sensitive membrane and the foreign particle, but even more for the purpose of washing it away. This increased flow is produced by a double mechanism: in the first place, there is the supply of more blood and the stimulation of the secreting cells through nerve-influence; and in the second, there is increased intra-vascular pres-

Objections

Purpose of sneezing

sure from overfilling of the venous sinuses, as described in Chapter I. Now this pressure in the venous sinuses must be enormously increased by the convulsive expiratory act comprised in sneezing. This latter consists in a violent contraction of the diaphragm, etc., together with a closing of the glottis, of the post-nasal space by contraction of the velum and superior constrictors, and of the buccal orifice by the approximation of the tongue firmly to the teeth and hard palate; in fact, every possible movement is thrown into action to prevent the exit of air from the larynx, mouth, and nose. What is the immediate consequence of this? Increase of the intra-thoracic pressure, which necessarily increases intra-vascular tension, especially in the veins, and hence in the venous sinuses of the nose. The act of forcible expiration with all the outlets from the thorax closed, if voluntarily induced, *i.e.* without the preliminary irritation in the nose, is scarcely operative in producing the effect described; and it is probably only when the nerve stimulation is excited at the same time, and the gland cells are set working, that this increase in the venous pressure is of some additional assistance.

Mechanism of sneezing

On the entrance of a foreign body into the nose and its passage to the posterior regions we have, as has been remarked, cough substituted for the sneezing. The phenomenon probably results from that area being approached, the stimulation of which results commonly in the expulsion of the offending body. The same theory would explain the attempts at deglutition.

Cough and deglutition

We may now proceed to the diseases originating, actually or theoretically, in irritation of the mucous membrane in the nose. Foremost among them stands conspicuously the train of symptoms commonly called hay fever. With the majority of these there can be

Hay fever

no manner of question as to their resulting from a reflex-action originating in the nose. The sneezing, lachrymation, rhinorrhœa, and swelling of the inferior turbinated bodies are but physiological symptoms produced in individuals whose nerve-terminations or nerve-centres, from pathological or other reasons, are of a peculiarly sensitive nature. The further symptom, one almost as characteristic as those mentioned—viz. the asthma—cannot be said to be the result of intranasal irritation, so far as we are acquainted with the physiological consequences of such stimulation. And it is hardly obvious why, even on clinical grounds, it is necessary to conclude that the bronchial spasm, like the sneezing, etc., results from excitation of the nasal mucous membrane. For it must be remembered that the inspired current of air, after its passage through the nose, encounters other regions perhaps as sensitive, but which, from the filtering properties of the nose, are less often exposed to the irritation of foreign substances. It appears perfectly permissible to assume that, as the nose resents the intrusion of irritating particles, so also will the bronchi, which in their turn will, by contracting their calibre, prevent the offending irritants from entering the lungs themselves. Hence sources of irritation, which have escaped the filtering power of the nasal mucous membrane, will pass on to the lower respiratory passages, and there excite in a similar manner reflex-actions that result in a contraction of the bronchial tubes. After the exciting cause has persisted for a variable interval, the swelling of the erectile tissue in the nose may become so intense as to occlude the nasal passages altogether; and in this case it is quite conceivable that, fewer particles being

All the symptoms physiological except asthma

Is asthma a nasal reflex?

Bronchial spasm due to direct irritation

arrested in the higher regions of the respiratory tract, the bronchi will be more exposed to irritation, and the asthmatic symptoms will be more severe. Consequently the benefit accruing to such patients from having pathological conditions of the nose rectified, so far as there is any source of obstruction beyond that temporary one arising from the transitory turgescence of the erectile tissue, is perfectly intelligible. Yet two cases of hay fever occurring in my own practice, while throwing considerable light upon the value of the theory of nasal reflex as being the source of the asthmatic symptoms, point to the aggravation of the latter after nasal treatment. In one—that of Dr. L. (see Case 39)—there had been intense suffering from all the worst symptoms of the affection for nine consecutive summers. After having the abnormalities of the nose rectified, he passed through the following summer absolutely free from all the most distressing symptoms; but although the sneezing, lachrymation, and nasal obstruction had entirely ceased, the asthma was distinctly worse. This, however, he declared to be of quite a minor importance, as it never lasted many minutes. The other case was that of an American gentleman, also belonging to the medical profession, who had suffered the greater part of his life from all the usual symptoms of hay fever, and had had, to use his own expression, "his nose cleared out" on several occasions by the most distinguished specialists in America. He assured me that, although his purely nasal symptoms were considerably relieved, his asthma was emphatically worse. He, moreover, asserted that it was not an unusual experience with his countrymen, suffering from the malady, to find their asthmatic symptoms

Asthma sometimes increases after rectification of nose disease.

Cases

aggravated rather than improved by surgical treatment of the nose. I may remark that both these patients volunteered the information without being asked any question whatever on the subject. The explanation of such cases as these may possibly be found in the reflection, that, while the treatment obviated the mutual friction of opposing surfaces consequent on slight swelling of the erectile tissue, by making the nasal fossæ actually wider, it at the same time facilitated the access of the irritating particles to the tracheal and bronchial mucous membrane, and thus intensified the asthma.

Explanation of such cases

But before dismissing the subject of the so-called nasal asthma, it is only fair to state the views of some whose opinions, judging from the value of their work in general, one would hold entitled to a respectful consideration. Conspicuous among these is Dr. Bosworth of New York. He informs us that out of eighty cases of all forms of asthma, including thirty-four of hay-asthma, forty-six were cured and twenty-six improved. In every one of these cases there existed intra-nasal disease sufficiently well marked to justify, in the observer's opinion, the theory that it might exercise a decided effect in the production of the symptoms. He further argues that if the asthma was cured through the medium of the nose, we may conclude that the nose was the source of the trouble. He makes no suggestion of the possibility of the interference to nasal breathing being a direct cause of the immediate irritation of the bronchial mucous membrane.[1] And although no other statistics have been offered by other authorities, it must not be

Other opinions

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[1] "Asthma, with an Analysis of Eighty Cases," etc., *American Journ. of Med. Sciences*, September 1888.

forgotten that many, whose experiences cannot be overlooked, strongly insist upon the same point. Thus Trousseau has added the weight of his opinion, while Voltolini, as long ago as 1872,[1] published cases of asthma, where the cure of associated mucous polypi in the nose was followed by the cure of the former affection. To these must be added the convictions of such authorities as Sir Andrew Clark, Hack of Freiburg, M'Bride of Edinburgh, and Krause of Berlin;[2] with J. N. Mackenzie of Baltimore, Beverly Robinson of New York, Sajous and H. Allen of Philadelphia.

Above experiences not inconsistent with author's theories

Now, without disputing for a moment the observations of such men as these, it will not, I trust, be considered impertinent to suggest that they were made when the true importance of nasal respiration was not receiving the consideration to which it is entitled. For every case where asthmatic symptoms are relieved by restoring the passages through an obstructed nose may be accounted for on the hypothesis that, as soon as the nose is permitted to perform its functions, the bronchial mucous membrane is saved from the irritation to which it was formerly subjected. Moreover, in the face of the many cases that must have occurred to every one possessing a large opportunity of treating such, where no relief followed the rectification of the nasal disease, the reflex-theory appears deficient; while in the instances I have quoted, where the asthmatic symptoms have been made actually worse, although the concomitant nasal troubles have been cured, it falls completely to the ground. Yet there is no manner of doubt that a considerable number of asthmatical patients suffer from intra-nasal diseases, the majority of which are polypi. Of this association I have seen many instances myself; and probably it is the experience of many who see such patients and possess the necessary skill in examining the nose. Thus Schech, of Munich, declares that 64 per cent of his patients are thus affected; though Dr. de Havilland Hall tells me he believes the association to be very rare. Anyhow, it by no means follows that the nasal disease is the cause of the asthma. Just as many an attack of bronchitic asthma begins in a paroxysm of sneezing and other signs of rhinitis, so, I believe, do we find the two regions simultaneously involved in a chronic inflammatory process, which finds its expression in the production of polypus in the nose, and of bronchial catarrh and spasm lower in the respiratory tract. Finally, if the intra-nasal irritation, in cases of polypus, is the starting-point of the asthma, it is somewhat remarkable that, in any such case of long standing, the nasal mucous membrane should be so conspicuously deficient in common sensibility, as plainly exemplified during operative procedures.

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[1] *Die Anwendung d. Galvanokaustik*, Wien, 1872, p. 246. Dr. J. N. Mackenzie tells us that Aurelian, Zecchius (1650), Schneider, Floyer (1726), etc. etc., were well acquainted with the connection between asthma and nasal disease (*New York Med. Journ.*, August 1887).

[2] The last-mentioned refers to some physiological observations of Wegele, Kratschaur, etc., tending to prove a certain relation between the trigeminus and the respiratory function (*Deutsch. Med. Woch.*, 1886, No. 32). On the other hand, Shurley, of Detroit, made elaborate experiments on the living animal, which showed that no form of irritation of the terminations or ganglia of the fifth nerve caused any contraction of the bronchial tubes (*New York Med. Journ.*, 19th January (1889).

Nose disease and bronchitis frequently associated

For my own part, while I have met with sixteen cases where asthma was associated with sneezing and nose disease, I have found the bronchial symptoms materially relieved in only six, although in every case

Author's statistics

the general comfort was much improved by the restoration of nasal breathing,[1] and the cessation of the sneezing. Four cases were completely cured, two of them having been great sufferers: three were instances of ecchondrosis of the septum, the fourth being one of post-nasal adenoids. The two others were greatly relieved, one case being polypus, and the other hypertrophy of the inferior turbinated (see Cases 47, 48, and 49).

From a consideration of these statistics it will naturally be inferred that the prognosis presents considerable difficulties. In some of the cases where I was most hopeful of alleviating the distress I have signally failed; while, on the contrary, in the least promising of my patients (Case 47) I had truly surprising results. But I do not think it exaggeration to say that in every asthmatic, whether the disease is said to be spasmodic or bronchitic, any abnormality of the nose should be rectified, although it may be necessary to point out that one is by no means sure of the result, so far as the asthma is concerned. From my own experience, which is somewhat limited, I am inclined to think that in cases where cocaine applied to the mucous membrane of the nose gives relief to an attack of asthma, we may be more hopeful than if it fail. Yet in one of my cases, where in every attack this relief was conspicuous, intra-nasal surgery failed to mitigate the paroxysms either in frequency or intensity.

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[1] Last summer I effected a cure in a case of exaggerated hypertrophy of both inferior turbinateds of ten to twelve years' duration. During most of this period there had been complete obstruction. There had never been any symptoms of asthma; but six weeks after I had dismissed the patient as cured, he appeared suffering from severe bronchitic asthma! The nose was perfectly free of obstruction and catarrh. Probably the asthma was a mere coincidence; but it is interesting in reference to the point under discussion.

Epilepsy may originate in nose

A few words will suffice to place before the reader the question of the possibility of epilepsy arising as the consequence of intra-nasal stimulation. One case of remarkable cure in a patient, the subject of post-nasal adenoid growths, sent to me for operation by Dr. John Davies, of Nottingham, is worthy of note (see Case 36). Sir Morell Mackenzie reports a most interesting case, seen in conjunction with Dr. Hughlings Jackson;[1] and Loewe[2] another; while Elsberg[3] stated that he had met with cases of chorea as well as epilepsy due to reflex-irritation within the nose. Among more recent cases may be mentioned two reported by Dr. F. S. Crossfield, of Connecticut, to the Section of Laryngology at the American Medical Association, 1889. These were both epilepsy, cured by the removal of nasal obstruction;[4] more lately six cases have been recorded by Schneider of Cologne.[5] J. N. Mackenzie says that the connection between epilepsy and intra-nasal disease was known to the Ancients.[6]

Reflex-theory not established

Such facts are beyond all dispute. Yet it is not quite clear that we are justified in attributing the symptoms to the irritation of the trigeminus, until further and more precise observations are forthcoming. My own case certainly suggests the possibility of actual interference in respiration being a possible source of the general convulsions, which began in deep obstructive snoring, passed into spasm of the glottis, and ended as soon as the patient was awakened. This view is corroborated by the fact that the patient had an attack on one occasion three months after the removal of the obstruction, when he took a severe cold, and his nasal breathing again became partially obstructed. The course of the symptoms was then precisely similar to that observed prior to the operation.

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[1] *Diseases of the Throat and Nose*, vol. ii. p. 361.

[2] *Allgemein Med. Central Zeitung*, 1882, No. 76.

[3] *Philadelph. Med. News*, 1883, p. 604.

[4] *Journ. of Laryng. and Rhinology*, October 1889, p. 440.

[5] "Einige Fälle von geheilter Reflexepilepsie der Nase," *Berlin Klin. Woch.*, 1889, No. 43, p. 934. The author's account of the diseases of his patients makes one doubt if he be thoroughly conversant with nasal affections, though the symptoms are recorded with great minuteness. The paper concludes with the statement that he has had other three cases not yet ripe for publication, since only eighteen months have elapsed since their cure.

[6] *Loc. cit.*

Of the further affections, supposed to be due to reflex-action instigated in the nose, I have no experience; nor, I believe, have my colleagues at the Hospital for Diseases of the Throat. Such diseases are various aural symptoms, pharyngitis sicca, headache, vertigo, functional laryngeal pareses, enlarged thyroid, etc. Cases in which these affections are to be cured by intra-nasal surgery have not sought treatment at my hands.

2. *Hay Fever and Paroxysmal Sneezing.*

Ætiology of hay fever

The ætiology of hay fever has been a matter of interest and discussion since the matter first appeared in the field of medical literature in 1819, when Bostock published an article on the subject in the *Medico-Chirurgical Transactions*.[1] Since then it has been the excuse for innumerable theories as to its nature. Most of the communications of any value have been contributed by sufferers themselves, so that considerable weight has been attached to the most

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[1] 1819, vol. x. part i. p. 161.

History

divergent hypotheses. Thus Helmholtz, holding that the "symptoms were produced by vibrios, which, although existing in the nasal fossæ and sinuses at other times, were excited to activity only by the summer heat,"[1] imagined he had found a specific for the affection in the injection of quinine into the nose, which appeared to give him the required relief. In 1873 Dr. Blackley,[2] of Manchester, published a most important and the first scientific work on the subject. He succeeded in conclusively proving that, at any rate in his own person, the pollen of certain graminaceæ was the exciting cause of the remarkable train of symptoms. He also remarked upon the striking idiosyncrasy which renders only the few susceptible to a source of irritation to which every one must be more or less exposed; but he was unacquainted with the local conditions which, to a certain extent, appear responsible for the idiosyncrasy. Four years later Dr. Beard,[3] of New York, published a brochure, the result of extensive inquiries in his own country, wonderfully prolific of the disease. In this publication he showed that a large percentage of the sufferers are of a neurotic temperament, and that constitutional treatment directed towards the amelioration of this condition is often of considerable value. In the following year Dr. Marsh,[4] also of New York, wrote with the object of showing that the pollen of the ragweed, flowering in the autumn, was the only source of the complaint. In the year 1882 a theory was advanced by Dr. Daly,[5]

Pollen theory

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[1] *Hay Fever, its Etiology and Treatment*, by Sir Morell Mackenzie, third edition, 1885, p. 10.

[2] *Hay Fever*, second edition, 1880.

[3] *Hay Fever or Summer Catarrh*, 1876.

[4] *Hay Fever or Pollen-Poisoning*, New Jers. Med. Soc., 1877.

[5] *Archives of Laryngology*, vol. iii. 1882 p. 157.

of Pittsburg, which has been embraced with great ardour by almost every nose-specialist both in America and in Europe. He claimed that the train of symptoms was due entirely to actual, objective intra-nasal disease, and quoted some cases in which he had cured the symptoms by correcting the nose-disorders. His hypothesis that the nose itself is the seat of the trouble, has been adopted, though with some variations and qualifications of the theory, by most American authorities, such as Roe,[1] Sajous,[2] and H. Allen.[3] In this country the theory has been embraced with great enthusiasm by E. Woakes, M'Bride, and, in Vienna, by Hack. J. N. Mackenzie[4] holds that the coryza, as he considers it, is dependent upon some functional derangement of the nerve-centres as its predisposing cause. In 1883 Sajous, of Philadelphia, brought prominently forward the theory that "hay fever was due to an idiosyncrasy on the part of certain individuals to become affected by certain emanations."[5] This fact, for such it must be considered by all who have approached the subject with unbiassed minds, was independently introduced a year later by Sir (then Dr.) Morell Mackenzie, who held to it so strongly that apparently he failed to see that local conditions had any bearing in the case.

Intra-nasal disease

Idiosyncrasy

Author's views

My own experience, though somewhat limited in these cases, has led me to the following conclusions. The affection is perhaps best defined as paroxysmal sneezing. A title for a disease should keep clear of theory; and, as a designation, a constant symptom is preferable to a varying cause. By adopting such a name for the disease suggested, it is made to include the host of cases presenting all the subjective and objective symptoms of hay fever, but arising from causes other than those at work during the summer months. If we exclude such, it must be granted that the patients suffer from one disease in the summer and another in the winter, although the symptoms, subjective and objective, are the same in each case, the only difference being the exciting cause. As well might we argue that two attacks of gout were different diseases because one was excited by port and another by want of exercise. Therefore, including all these cases, we may assert that the affection is due to an abnormal sensitiveness of the nasal mucous membrane to sources of irritation differing in different individuals. Thus, while in one person the symptoms are induced by the pollen of the grasses, and occur in the early summer months, in others the attacks are due to the ragweed (*Ambrosia artemisiæfolia*), or to roses or peaches; while in the same or in yet other cases, insusceptible of the influence emanating from such vegetables, we find a draught of air, common dust, or unrecognised sources of irritation, producing the symptoms. This abnormal sensitiveness again appears to be induced or aggravated in many cases by anatomical abnormalities in the nose, whether pathological or not; while, so far as these are amenable to treatment, the symptoms are susceptible of amelioration. In many cases, however, the nose is perfectly normal in appearance, and in such one can hardly look for improvement. In all, however, the mucous membrane appears to be abnormally

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[1] *New York Med. Journ.*, 12th and 19th May 1883.

[2] *Med. and Surg. Rep.*, 22d December 1883.

[3] *Am. Journ. of Med. Sci.*, January 1884.

[4] *New York Med. Record,* 19th July 1884.

[5] *Loc. cit.*

The term 'hay fever' objectionable

sensitive to tactile stimulation. So much for a brief statement of fact.

Heredity

The most striking predisposing cause is heredity. Thus Sajous tells us that of forty cases of hay fever "35 per cent have near relatives who present a clear history of hay fever or rose-cold, and that 42 per cent have asthmatic relatives."[1] Race presents an important factor; for the affection, so far as it arises from the irritation of pollen, appears to be confined to the Anglo-Saxon blood, whether in Europe or America. It is unknown in the tropics and is stated not to exist in Australia: one of my patients, however, was strongly affected on exposure to ripe rye-grass on a farm near Melbourne (Case 41); while I am informed by another, resident in Adelaide, that in the spring, during the blooming of a species of dandelion which covers the surrounding hills to a certain altitude, almost every one suffers from more or less sneezing! As to sex, the general opinion appears to be that males are more susceptible than females. Thus Mackenzie, among his hay-fever patients, has met with thirty-eight of the former to twenty-three of the latter.[2] As indicated by Beard, the majority of the patients are of a neurotic temperament, although a large proportion are doubtless in perfect health. Of this I have seen several conspicuous examples. This nervous temperament accounts also for the fact that the large proportion occurs among private patients as distinguished from the hospital-class, although my experience does not tally with Mackenzie's, who states that he, in his large experience, has never met with a case among the latter. I can recall several cases in hospital-

Race

Neurotic temperament

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[1] *Hay Fever*, Philadelphia, 1885, p. 16.

[2] *Loc. cit.*, p. 19.

patients where the symptoms have been aggravated during the hay season. Blackley and others have remarked that it is chiefly the town-dweller who suffers. Doubtless, the rustic is comparatively exempt; but I can recall among my cases instances of robust country gentlemen highly susceptible to pollen irritation. A popular belief, which appears to have some slight foundation in fact, is that the thin aquiline nose is more liable than others to sneezing affections, and that this accounts for the greater prevalence of hay fever among the aristocracy.

Aquiline nose

Exciting causes

Whatever the predisposing factors, whether local or constitutional, every attack of paroxysmal sneezing is dependent upon some definite exciting cause, the nature of which is guided by the idiosyncrasy of the individual patient. Dust of one sort or another is the immediate cause of the attack in most patients, although the nature of the particles composing it varies in each case. Thus in the form of the affection making its appearance in the early summer months, the pollen of certain graminaceæ is directly responsible for the irritation, as proved by Blackley in a series of most admirable experiments on himself, a considerable sufferer from the affection. In America there is a second variety appearing in the autumn, due to the pollen of the *Ambrosia artemisiæfolia*, which blossoms in the months of August and September. This plant is unknown in Europe, and Dr. Marsh claims that it is the sole cause of the affection in the United States. But in this he is obviously in error, seeing that the early summer has its victims as in this country. In America also they have similar symptoms arising from roses, and to these is given the popular name of rose-cold. Some patients are affected by only one or more of

Dust

Pollen

Two varieties of pollen-catarrh in America

Other sources of irritation

these various sources of irritation, while others may be irritated by every one. Not infrequently a patient is liable to be equally affected by any form of dust, all the year round, although the symptoms are only fully developed during the summer months; another will be attacked only by certain forms of dust, as, for instance, when dusting furniture, or by the emanations from a feather-bed. Or again, a patient may develop an ordinary chronic rhinitis with periodical paroxysmal sneezing, and after its persistence for a few years, for the first time in his life, he may become susceptible to the influence of certain forms of pollen (see Case 40). So that, in the face of such facts, one hardly perceives the justification in reserving the term "hay fever" for those cases arising from one source of irritation rather than another. Were we to consent to this, we must have innumerable designations for the same train of symptoms according to their various exciting causes.

Hay fever not a disease but a train of symptoms

Definition

The fact is, that we cannot consider hay fever as an affection *sui generis*, but merely as a train of symptoms, due, in the first place, to a peculiar idiosyncrasy on the part of the individual, which may be actually induced or merely enhanced by certain departures from the normal condition of the nose, pathological or otherwise, which interfere with the easy performance of the functions of respiration. This statement appears to me to be the best possible definition of the term "hay fever" consistent with the various facts and independent of theory insusceptible of experimental verification. It forms no argument against such a definition to assert that the so-called typical hay-fever patient often presents no departure from the normal in the objective appearances of the interior of the nose. For the most hyperæsthetic nasal mucous membrane I

Most patients present nasal abnormalities

have ever witnessed was sensitive to every source of irritation except pollen, and presented not the slightest objective fault. Yet there is no question that the majority of all patients subject to paroxysmal sneezing, etc., from whatever excitant arising, do present aberrations from a condition of perfect health; and the treatment of such conditions indubitably ameliorates or removes the symptoms in the majority of cases.

Symptoms

Subjective

Date of appearance

Premonitory

In describing the symptoms we may divide them into two classes, between which, however, there is no sharp line of demarcation. The first comprises those cases where the disorder is due to the irritation of pollen, etc., and the second those which suffer independently of the season of the year with its attendant vegetation. With the first class the premonitory symptoms usually make their appearance during the first week or ten days in June. In cold seasons the appearance is more or less delayed, while, in the reverse conditions, their onset may be considerably earlier; thus, for instance, in the summer of 1889, the patients began to suffer a full three weeks earlier than their wont. The premonitory warnings vary considerably with the individual. A common one is an itching, smarting, or burning at the inner canthus of one or both eyes. Others will complain of similar discomfort in the throat or roof of the mouth. Sometimes the irritation is confined to the alæ, while with others, again, the earliest symptom is a curious coldness of the tip of the nose. These or other incipient symptoms persist for a period, varying from a few hours to two or three days, or even weeks, before the sneezing supervenes. But usually the attack asserts itself with great suddenness and in its full force at the outset. The irritation in the nose and conjunctiva, and even in the pharynx, begins almost simultaneously. The inferior turbinated swells with great rapidity until the nasal passages are completely blocked; and, certainly in some cases, the overfilling of the venous sinuses appears to precede the reflex symptoms. Then the nose and eyes begin to pour out their secretions, the eyelids swell until they are almost closed, and the lachrymation adds to the profuse discharge from the nose. The attack will persist in varying intensity from a few minutes to several days, according to the sensitiveness of the patient, the intensity of, or the length of exposure to, the initial source of irritation, and the anatomical condition of the nose. The discharge from the nose is sometimes extraordinarily profuse. One of my patients declared that she would saturate a large towel in the brief space of half an hour. When the attack is prolonged there is generally more or less depression, mental as well as physical, especially in those patients who are markedly of a neurotic temperament. Even after the sneezing has ceased, the rhinorrhœa may continue for many hours, and is sometimes continuous during the whole of the season. In rare cases the temperature is said to be raised, though this I have never observed. Occasionally in very severe cases there may be some photophobia, and the discharge from both nose and eyes may become mucopurulent. Sometimes, after the persistence of the coryza for a few days, there is added, as a further trouble, spasmodic asthma, which differs in no material way from ordinary attacks of the affection: not infrequently it constitutes the whole trouble. This I have on two occasions noticed in patients who habitually, all the year round, adopted buccal respiration

Swelling of erectile tissue

Duration of attacks

Mental depression

Photophobia

Spasmodic asthma

Cases

from grave structural stenosis—in the one from ecchondrosis of the septum, and in the other from post-nasal adenoids. So that in these cases, at any rate, it is probable that the asthma was induced by direct irritation of the bronchial mucous membrane rather than by a reflex-action originating in the nose. In another of my cases, as has been already remarked, the asthma supervened after the nasal symptoms had persisted for nine years, and that only after the nose- and eye-symptoms had been cured by intra-nasal operation. (Case 39). The bronchial spasm never presents such gravity as is seen in bronchitic asthma; and, its duration extending at the worst over only a few weeks in each year, as the consequence of pollen-irritation, it never leads to emphysema of the lungs.

Periodical sneezing

The symptoms are not materially different in those cases in which the exciting cause is other than the pollen of different plants. In such we sometimes find a daily recurrence of the attack at a constant hour, usually in the early morning, and tending to subside as the day advances. These attacks are also accompanied by great depression, and the subjects are generally of a neurotic temperament. They are sometimes extraordinarily sensitive to every sort of stimulation of the nose, either internally or externally. Thus in one of my patients, a lady of highly-strung and excitable temperament, the insertion of the nasal speculum was sufficient to induce an attack of sneezing which would last for two or three hours afterwards. She assured me, moreover, that, when she was overtired, it was sometimes sufficient to feel the breath of another person on her face to induce the whole train of symptoms, entailing the use of a dozen pocket-handkerchiefs, or more, before the attack would terminate. In these cases asthma, in my experience, is less frequent than in those due to pollen-irritation, though we not infrequently see attacks of spasmodic or bronchitic asthma, the result of exposure to cold, beginning with paroxysmal sneezing. Or again, when dust is the source of the irritation, we occasionally find asthma added to the physiological nasal reflex.

Objective examination

Examination of the nose during an attack reveals nothing beyond the ordinary symptoms of acute and chronic catarrh. In old-standing cases not infrequently the inferior turbinated bodies present a remarkable pallor of surface. During the intervals of the seizures we may observe any of the conditions met with as the results of chronic rhinitis, needless to enumerate. Especially often are encountered hypertrophies of the septum and inferior turbinated bodies; while polypus, less frequently observed in association with pollen-irritation, is without exception the most usual direct cause of paroxysmal sneezing.

Prognosis

The prognosis of these cases is favourable so far as the termination of the actual attacks is concerned, and especially in those cases confined to the early summer months. In the course of time the symptoms appear to lead to actual hypertrophies of the inferior turbinated bodies or of the septum—though of the latter one can make no positive statement. Certainly one finds many cases where the obstruction in the nose is said to be steadily on the increase, although the sneezing, etc., occurs only in the summer. Some cases, moreover, beginning in the summer, and at first occurring only then, gradually in the course of years begin to persist throughout the year, until the nose becomes permanently obstructed. Some few cases appear to lose their sensitiveness as they grow older, though these would presumably be cases where there was no structural fault or hypertrophy. As regards the results of medicinal treatment, the prognosis cannot be said to be favourable beyond the momentary relief afforded. But to this statement there are occasional exceptions, as will be related immediately. On the other hand, the prognosis, after judicious surgical treatment in selected cases, is highly satisfactory, if we hope for something short of absolute cure in cases of pollen-catarrh. Where paroxysmal sneezing persists throughout the year, aggravated or not during the pollen-season, we may, in most cases where there is positive stenosis of the nose, however slight, hold out hopes of actual cure. Such cases, moreover, if left to themselves, decidedly tend to grow worse rather than better. As has been already remarked, when hay-asthma accompanies the nose-symptoms, we are compelled, prognosticating concerning the former, to speak more guardedly than when referring to the latter. We must, moreover, remember the possibility of rendering the asthma worse as a consequence actually of the improved condition of the nose. Nevertheless, the asthma symptoms, at their worst, are never very distressing, the patients generally considering them of quite minor importance. Moreover, there is not the least fear of this form of asthma leading to emphysema of the lungs.

Few cases show spontaneous amelioration

Prognosis good where structural faults can be remedied

Prognosis of asthma less favourable

Treatment

The treatment of the pollen-form of the complaint in those cases where there is no opportunity of surgical interference is decidedly less satisfactory. The patients are compelled to seek those resorts which, from their geographical characters, will expose them least to the possibility of encountering the contamination. Cities and the sea-coast are pretty generally found to afford

Climate

a certain amount of immunity from the severer symptoms; but a sea-voyage, especially to the tropics, is the surest means of escaping. Those who are inevitably compelled to reside in the country during this season, should avoid being out of doors during the hottest part of the day and when the wind is high; they should eschew severe exercise, rapid movements, riding and driving, seeing that the greater the velocity of the current of air encountered, the greater the exposure to the irritating particles carried by it. When out of doors, these patients are compelled to wear blue spectacles, to plug the nostrils with cotton wool, and to wear substantial veils. Nothing finer than the material known as gossamer appears to be of much use, and such a covering to the face in the summer months is unpleasantly warm. Altogether the patient's life under such circumstances is not to be envied. Medicinal treatment is not of much avail. Seeing that most of these patients are of the neurotic temperament, and that the affection is in itself exceedingly exhausting, everything possible must be done to sustain the energies. Nerve tonics, assafœtida, and valerian (see Form. XXVIII.) are said to be of some value, while most of the patients are the better for a small amount of stimulants. Innumerable local remedies may be mentioned as having been more or less strongly advocated by one authority or another; but their very number proclaims their uselessness in the vast majority of cases. Chloride-of-ammonium vapour, Ferrier's snuff, compound tincture of benzoin as an inhalation, have all proved useless in my hands, beyond giving a very transitory relief. Some find tobacco-smoke of advantage, while others praise the cubebs-cigarettes. The opium-pipe has been strongly recommended, and I

Precautions

Physic of little use

Tonics

Local remedies

have known of its giving more relief than anything else. A very few whiffs are sufficient, and there is no very cogent objection to its employment. But of all local applications I have found the most conspicuous benefit from a spray of very weak chromic acid, one-eighth to one-sixteenth of a grain to the ounce of water (Form. VI.); this should be sprayed warm into the nose for five minutes three or four times a day, according to the severity of the case and the relief experienced. One of my hay-fever patients, who considered herself cured after the removal of a small ecchondrosis of the septum, is yet unwilling to relinquish her chromic spray. This she keeps at hand, and in the early summer months, on experiencing the least discomfort in the nose, has immediate recourse to the remedy, which she declares never fails her. In another similar case, not of the severest type, the patient was completely cured after a week's use of the remedy. But it must be confessed that in the majority of instances it proves quite inoperative. Similar in its action to this is perhaps the perchloride of mercury, which two years ago was being strongly advocated by different medical men who had tried it on their own persons upon the recommendation of Dr. Carl Genth.[1] It consists in the application to the conjunctiva, at the first warning of the symptoms, of a solution of corrosive sublimate of a strength of 1 in 3000. This was to be applied after each exposure to the influence of the pollen. It is said to arrest almost completely the subsequent symptoms. But of its efficacy I have had no experience.

Chromic acid

Perchloride of mercury

Of all remedies none is so likely to give relief as cocaine, applied, in one way or another, to the mucous

Cocaine

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[1] *Brit. Med. Journ.*, June 1888, p. 1268.

membrane of the nose. When first used, it is usually infallible in giving more or less complete relief. But its effects rapidly pass away; and after using the remedy for any length of time, it invariably becomes necessary to increase the quantity applied to a great extent. A solution of 4 per cent may probably be used with impunity, especially if care be taken that it runs rather out at the nose than into the throat; but when 10 and 20 per cent solutions are necessary to produce the desired effect, the nervous system will almost inevitably suffer. Of this fact I have seen several instances, two occurring in medical men. Dr. Windle,[1] in speaking of the use of the drug in his own person, stated that the advantage accruing from it was more than counterbalanced by the serious general derangement of the nervous system which its prolonged use engendered; and Dr. W. S. Paget makes a similar observation drawn from his personal experience.[2] So that we are probably justified in hesitating to prescribe so potent a remedy, if such it can be called, when at best its effects are but transitory.

Its disadvantages

Sir Andrew Clark's treatment

Sir Andrew Clark[3] has recommended in the strongest terms a method of diminishing the irritability of the nasal mucous membrane which he has adopted for many years. It consists in the application to the nasal fossæ, and, if necessary, to the naso-pharynx also, of a solution of quinine and perchloride of mercury in glycerine of carbolic acid (Form. XXIX.) He directs it to be applied with a camel-hair brush on alternate or every three days. He gives very minute direction as to the precise method of treatment. There is, of course, no disputing that the learned physician has had remarkably good results from this treatment; but, after having had the intense suffering produced by the process detailed to me more than once, I have hitherto hesitated in applying it in any of my cases, and shall hardly do so until I meet with one where other means have failed.

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[1] *Brit. Med. Journ.*, 5th January 1889. [2] *Ibid.*, 28th July 1888.

[3] "On a Speedy and sometimes Successful Method of Treating Hay Fever," *Brit. Med. Journ.*, 11th June 1887, p. 1255.

Surgical treatment

The only scientific and practical method of treating the affections comprised under the terms "hay fever" and "paroxysmal sneezing" is surgical, and then only so far, in my experience, as the nose presents abnormalities of structure, due either to hyperplasiæ or hypertrophies. Polypi, of course, must be removed as well as enlargements of the inferior turbinated body, both of these being frequent sources of paroxysmal sneezing, though polypi are uncommon in the typical hay fever. Vascular engorgement of the inferior turbinated body is frequently encountered as a fruitful source of increased sensitiveness of the mucous membrane, in all grades of the symptoms. But most frequently we have to deal with ecchondroses and exostoses of the septum, even when so small as to cause no material encroachment upon the calibre of the fossæ. I have sometimes found the removal of a small inequality of the surface, when the position was such that the least swelling would bring it in contact with the middle, or less often with the inferior turbinated bodies, sufficient to cure completely the most distressing symptoms of many years' standing; while the results are no less conspicuous when dealing with larger hypertrophies coming in contact with the inferior turbinated during its temporary erection. Disease of the middle turbinated, excluding for the moment polypus, is quite exceptional as a cause of paroxysmal sneezing in my experience; while I have never met with disease of the bone, except in

Cases suitable

one of the cases of cyst of the middle turbinated already mentioned, producing conspicuously paroxysms of sneezing. From the results of treatment in my successful cases, I am strongly of opinion that the anterior portions of the septum are the regions the irritation of which most frequently gives rise to the reflex-symptoms in question. This also would appear to be the view held by Sajous, who advocates the linear and punctate application of the galvano-cautery to certain sensitive spots on the septum and on the outer wall in front of the middle turbinated. These sensitive spots can be discovered only by the exploration of the surface with the cautery-point itself before rendering it incandescent. Cocaine must not be used; and, as soon as the patient communicates the fact that the point touched is sensitive, the button is pressed, and the cauterisation made immediately. It is said to be not very painful if the heat is of a cherry-colour. Chemical caustics may be applied in a similar manner with a *porte-caustique* designed for the purpose.[1] My experience in this mode of treatment has been confined to a single case, and in this one the benefit was not conspicuous; but I hope to give it a further trial.

Anterior parts of septum

Electric cautery

3. *Idiopathic Rhinorrhœa.*

Under the head of the Nasal Neuroses must be classed a collection of somewhat anomalous cases, probably varying considerably in their ætiology, although the symptoms must be immediately ascribed to some abnormality of innervation, the prominent feature in each case being profuse rhinorrhœa. Briefly the symptoms are such as arise frequently from any form of mechanical irritation within the nasal fossæ, although in these cases there is usually no appearance of objective disease. Most commonly the flow from the nose begins at intervals of twenty-four hours, with or without itching or formication of the nose and more or less sneezing. The discharge, usually thin and watery, though sometimes milky,[1] or of a bright canary-yellow, as in two of my cases, is sometimes extraordinarily profuse, ceasing suddenly after one or more hours' misery. The discharge is often unilateral; it may be bitter to the taste, and said by the patient to be offensive, although no odour is perceptible to a bystander. Sometimes an attack appears to originate in severe mental application, and occasionally we are told that any occupation, such as writing or needlework, which necessitates the head being bent forwards, will induce the flow. The affection has often been ascribed to some severe physical shock, and two of my cases followed an attack of epidemic influenza. Most of the patients appear to belong to the neurotic temperament. After the running has persisted for a few hours, the nasal mucous membrane becomes pale and swollen, with more or less occlusion of the air-passages. The duration of the affection may be measured by days, months, or years, sometimes ceasing spontaneously and as unaccountably as it had begun. After persisting for a variable period it would appear that there is sometimes a curious tendency to the development of polypi. Bosworth relates cases proving this, and I can quote two such in my own practice. My observations also coincide with Bosworth's in that the destruction of such growths did little more than modify for a time the severity of the daily attack. In a case cited by Paget[1] a number of polypi were at the post-mortem examination found in the left antrum. In a recently-reported case[2] there was epiphora. Many of the recorded cases were evidently associated with nervous affections. Thus in a case, reported by Althaus,[3] of neuralgia followed by anæsthesia of the fifth pair of nerves, profuse rhinorrhœa formed a prominent symptom. In two cases reported by Nettleship[4] and Leber[5] the symptom accompanied atrophy of the optic disks. In yet another, that related by E. B. Baxter,[6] it was associated with double optic neuritis, enlargement of the thyroid, and headache. Bosworth[7] divides the cases into two categories: first, those due to impaired innervation of the trigemini, which possess an inhibitory action over the secretion of the nasal mucous membrane, and secondly, those which are closely analogous to ordinary cases of hay fever, from which, indeed, there appears to be no clear line of demarcation. Those comprised in the latter class may be associated with asthma, and are not always easy to dissociate from ordinary cases of chronic rhinitis where the same periodicity, as in hay fever also, may be characteristic. Nor in the absence of a chronic rhinitis is it always easy to determine whether the flow may not be due to irritation caused by an ecchondrosis, etc., or whether it be idiopathic. In such a case of difficulty the only way of elucidating the point is to operate.

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[1] *Hay Fever and its Successful Treatment by Superficial Organic Alteration of the Nasal Mucous Membrane*, by C. E. Sajous, M.D., Philadelphia, 1885.

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[1] Fischer's case, reported by Bosworth, *Diseases of the Nose and Throat*, p. 261.

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[1] *Trans. Clin. Soc.* 1879, p. 43.

[2] "Two cases of nasal hydrorrhœa," by T. M. Hardie, M.B., *New York Med. Journ.*, September 1890.

[3] *Brit. Med. Journ.*, 1878, vol. ii. p. 831; *Trans. Med. Chir. Soc.*, vol. iii. p. 29.

[4] *Ophthal. Rev.*, 1883, vol. ii. p. 1.

[5] Graefe's *Archiv.*, vol. xxix. p. 273.

[6] *Brain*, vol. iv. p. 525.

[7] *Diseases of the Nose and Throat*, 1889, p. 267.

These cases must not be confounded or classed, as has been done by Bosworth and Ball,[1] with others where a flow of arachnoid fluid occurs as the consequence of injury to the cribriform plate of the ethmoid. It is sufficient to mention the point in order to indicate the necessity of accurate diagnosis.

The treatment is unsatisfactory. Generally some relief may be obtained from judicious cauterisation of the inferior turbinated bodies, while cocaine may give some temporary relief. In two cases I have found the chromic acid solution (Form. VI.) of signal benefit, and hamamelis may be helpful. Althaus claims to have had good results in his case from the use of galvanism. But although the results of treatment are disappointing, yet the practitioner may always hold out to the patient the possibility of ultimate and spontaneous recovery.

[1] *Diseases of the Nose*, 1890, p. 147.

CHAPTER XII

POST-NASAL GROWTHS

Their Ætiology, Symptoms, and Treatment.

History

THE subject of post-nasal growths has been a matter of considerable interest to the profession for some years now—since, in fact, Meyer of Copenhagen, in 1868, gave the first account of their true clinical and therapeutic importance.[1] They had been previously described by Voltolini in reference to deafness, in the year 1865, though Czermak had observed in 1860, with his post-rhinal mirror, two small growths in the naso-pharynx, probably such as one not infrequently perceives remaining after the atrophy of larger masses of the adenoid vegetations. In 1865, also, Loewenberg published an account of three cases, and made a laudable conjecture as to their pathological anatomy. The same author, in 1879, published a very complete brochure on the subject, in which he entered very minutely into the disabilities of articulation presented by the patients.[2] At the International Medical Congress, held in London in 1881, the subject was very fully discussed, and most of the leading authorities on the subject of nose-disease presented their now extended observations.[1] Since then the disease has been familiar to the profession at large, although great divergence of opinion still prevails as to the importance of these obstructions to nasal respiration. Thus, while many of the older school maintain that it is never necessary to remove the growths, seeing that there exists a strong tendency for them to undergo spontaneous atrophy at puberty, some of the younger rhinologists hold that these adenoids are responsible for half the ills of infancy and young adult-life. In the following pages it will be attempted to place the matter before the reader in its just bearings, so far as the local and general health of the individual is concerned.

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[1] *Trans. Med. Chir. Soc.*, 1870, vol. lviii. p. 191.

[2] *Les tumeurs adénoïds du pharynx nasal : leur influence sur l'audition, la respiration et la phonation ; leur traitement*, Paris, 1879. This was translated and abridged by the late Dr. J. P. Cassells, and published in the *Edin. Med. Journ.*, 1879.

Divergent opinions as to their importance

Adenoid vegetations, as they were first called by Meyer, and for which no good substitute has been offered, occur chiefly in children and young adults. The fact that they are rarely seen in those of riper years is sufficient evidence that they possess a marked tendency to spontaneous disappearance. Of 200 cases, occurring in my own practice, 126 were males and 74 females. Meyer and Woakes found the affection almost equally prevalent in the two sexes; but Morell Mackenzie has observed almost the same relative proportion as myself.[2] Among my cases sixteen males and eleven females were between twenty and thirty years of age, two males and one female were between thirty and forty, while only one male was found over forty. Of the others, twenty-seven boys and fifteen girls were between sixteen and twenty years;

Author's statistics

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[1] *Trans. Int. Med. Cong.*, London, 1881, vol. iii. p. 278 *et seq.*

[2] *Diseases of the Throat and Nose*, vol. ii. p. 496.

and the remainder, viz. eighty boys and forty-seven girls, were under sixteen. So much for age and sex as ætiological factors.

Ætiology

The direct causes may be divided into predisposing and exciting for the sake of convenience, although the predisposing are often the only clue to the elucidation of the ætiology. As predisposing causes, heredity would appear to bear but a small part. Race, however, may have some share, since these growths, together with all forms of nasal obstruction, seem very common among those of the Hebrew religion. Beyond this, the only evidence bearing upon the point is the fact that, not uncommonly, several members of the same family are similarly affected. But, excepting the fact that certain anatomical peculiarities, to be immediately described, are hereditary, there is probably no disposition for the disease to occur in parent and child. Loewenberg, however cites some cases where heredity appeared to have a marked influence.[1] Climate appears to be of some importance in the production of the disease; for, while it is common in damp, cold climates, it is comparatively rare in the south of Europe, and is apparently less common in America than with us.

Predisposing causes

Heredity and race

Climate

Anatomical conditions predisposing

Some of the predisposing anatomical conditions have already been briefly referred to in discussing the relation of the physics of the nose to certain pathological conditions. But in that place attention was directed mainly to the theoretical aspects; and, before reverting to them, it is advisable to summarise such clinical facts as bear upon the ætiology. In a very large proportion of cases of post-nasal growths we find at the same time a well-marked anterior obstruction of the nasal fossæ in one form or another. The commonest of these is engorgement of the erectile tissue, which in some cases has advanced to actual hypertrophy of the inferior spongy body. Next in point of frequency we find the septum variously deflected and hypertrophied, sufficiently to cause considerable stenosis of one or both sides. So frequently does some other source of obstruction coexist together with the post-nasal adenoids, that it is exceptional to find nasal respiration completely restored by removing the adenoids, some further treatment of the anterior regions being demanded before the patient will instinctively keep the mouth closed. Associated with this deflection of the septum in these cases we not infrequently find a highly arched palate, which further encroaches upon the nasal fossæ. This form of palate, again, is sometimes associated with the contraction of the superior maxilla described by the dentists as V-shaped. The contraction is sometimes excessively pronounced opposite the bicuspids; and the more pronounced it is, the higher is the vault and the greater is the encroachment on the cavities above. Sir John Tomes says that this form of superior maxilla is frequently seen in children who are subjects of enlarged tonsils, which, as will be presently seen, are often associated with post-nasal growths. Indeed, he attributed the narrowing to undue pressure of the buccinator, consequent upon the buccal respiration and the depressed lower jaw. But although his clinical observation is of great value so far as it bears upon this point, we need not accept his explanation of it, especially as he has not repeated it in the subsequent editions of his work.[1] The majority of cleft-palate

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[1] *Loc. cit.*

Anterior stenosis

Deflected septum

V-shaped upper jaw

Enlarged tonsils

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[1] *A System of Dental Surgery*, second and third editions.

Cleft palate

patients suffer from post-nasal growths, as observed by Mackenzie, Loewenberg, Meyer, etc. The latter attributes it to the direct irritation to which the mucous membrane is exposed from passage of food into the post-nasal space. But, as a matter of fact, this is very rarely a source of complaint in these patients. Owing to the sphincter-like contraction of the superior constrictor, referred to by Billroth, the posterior wall of the pharynx comes almost into apposition with the margin of the hard palate.[1] The tonsils, moreover, by the same muscular agency are approximated, and thus the cleft is closed. So the theory of direct irritation is probably insufficient. According to Dr. N. W. Kingsley, of New York, the principal authority on the subject of oral deformities, congenital cleft-palate is usually accompanied by more or less deformity of the sides of the alveolar arch.[2] Sometimes they are abnormally far apart, but more often they are unnaturally approximated. This must correspond, as in cases of V-shaped superior maxilla, with contracted nasal fossæ; and thus far the condition is similar. Hence, taking one case with another, it would appear that there is, in the large majority of cases, some form of anterior nasal stenosis; and, correspondingly, we shall not be doing amiss if we inquire whether this, the only constant factor, can be proved a predisposing or even exciting source of the disease. Reference may now be made to the theoretical considerations contained in Chapter I. There it was argued that, wherever from any cause we have partial occlusion of the nasal fossæ, so long as respiration is conducted through the nose, there

Anterior stenosis in the large majority of cases

See p. 18 *et seq.*

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[1] *Clinical Surgery*, New Syd. Soc., 1881, pp. 80, 81.

[2] *A Treatise on Oral Deformities, etc.*, English edition, 1881, p. 206.

is, of a physical necessity, a diminution in the barometric pressure behind the seat of stenosis. This inevitably results in more or less overfilling of the blood-vessels, which, in its turn, leads to hypernutrition and hypertrophy. Hypertrophy of pre-existing elements is nowhere more conspicuously seen than in the case of the post-nasal adenoids. To substantiate the theory, it only remains to show that breathing is still conducted through the nose in spite of the difficulty experienced. In this place it will be sufficient to state as a fact that the instinct of nose-breathing appears to assert itself in spite of sometimes great difficulties, and especially during sleep. The point will be further enforced in discussing the symptoms produced by these neoplasms.

Nose-breathing in spite of obstruction

Struma

There are few other predisposing causes. Struma, supposed by some to be an important element, is a matter of very small importance, the patients being as often as not in robust health. I have, moreover, been struck with the fact that these patients have frequently exceptionally sound teeth, in spite of their being so frequently crowded together from compression of the alveolar arch.

Exciting causes

Exciting causes sometimes appear to be found in attacks of the exanthemata, especially measles and scarlet fever. But the actual date of the incipience of an affection such as this, where the symptoms do not consist in any complaints on the part of the patient, is obviously difficult to determine. In other cases there is occasionally a clear history of inveterate cold-taking, though here again, it is impossible to preclude all danger of confusing cause with effect.

Symptoms

The patient usually comes under the observation of the aural surgeon, seeing that the most prominent

Deafness symptom is deafness, and that the affection generally escapes notice until some such serious complaint supervenes. **Often disregarded** Yet only too often this deafness causes no uneasiness to the child's parents; and more especially if the family medical adviser assure them, as is only too often the case, that the child will recover spontaneously as age advances. The fact that children so easily contract a little Eustachian catarrh in the course of an acute rhinitis, from which they speedily recover, is the chief reason for supposing that deafness in children diminishes as they grow older; while it is perfectly certain that the subjects of post-nasal growths, although these may after some years disappear without any treatment whatever, nevertheless seldom completely outgrow the deafness resulting from their presence, unless operative measures be adopted. Yet, in spite of its frequency, deafness is often strenuously denied; though the parents, on being closely questioned, may admit that the boy is frequently punished for inattention at school.

Next, in the order of the frequency with which patients complain of the different symptoms, comes **Snoring** snoring during sleep. This is invariably present in a greater or less degree, though the child may be free from it for a portion of the night. It depends, it need scarcely be added, upon the indrawn current of air impinging upon the velum, which, if not enfeebled during waking hours, as is generally the case, yet is thrust farther forwards and downwards by the growths and thus is brought well into the current of air during buccal respiration. Yet we not infrequently hear this snoring, although the patient breathes with the mouth tightly closed. In this case also, the space behind being encroached upon, the inspired current of air is directed on to the upper surface of the soft palate, and thus sets it vibrating. In some of these patients, where the obstruction is so great that there is considerable interference with respiration—where also, the tongue being fixed in the arch of the palate, mouth-breathing is partially or entirely arrested—the symptoms become more severe. In one of my patients, sent to me by Dr. John Davies, of Nottingham, the snoring during the first sleep became louder and louder until it terminated first in an attack of laryngeal stridor, which, still further interfering with respiration, culminated in a mild attack of general convulsions. This happened regularly every midnight (see Case 36). Such a course of events, however, is fortunately very rare. At worst, the interference with respiration results in restlessness: the patient tosses about a great deal, throws off the bedclothes, and occasionally wakes with a mild delirium. Older patients dream, and on waking, may complain of a dryness in the throat, accompanied with a general feeling of malaise, which diminishes as the day advances. Sometimes complaint is made that the child never blows his nose, although his speech sounds as though he always had a cold in the head.

Convulsions

Restlessness

The speech does not differ materially from that found in other forms of nasal obstruction, though here we have always added a curious indistinctness and thickness of speech, resulting presumably from the want of muscular tone in the palate-muscles. Moreover, there is a remarkable tendency to substitute the unaspirated for the aspirated consonants; from which it would appear that the latter are assisted in their production by more resonance in the nasal chambers. Thus B is substituted for P, D

Speech

for T, and Dh for Th. M and N, depending entirely upon nasal expiration, become impossible to these patients, and they are forced to say *bay* for *may* and *day* for *nay*. Besides these changes, we have others depending upon the inability on the part of the soft palate to approximate itself to the posterior wall of the pharynx, either on account of the mechanical interference of the growths, or from a paresis of the palate, due to the coexistent congestion of the palatine glands and muscular tissue. The gutturals in these cases lose some of their value; we find G (hard) substituted for K, and *kick* becomes *gick*. In extreme degrees of enfeebled palate the inability to close the naso-pharynx may do more than overbalance the post-nasal obstruction, and the speech may approximate that of the cleft-palate patient. In this case D may become merged in N, and B in M, K and G may become almost impossible, while S and Ch (soft) are also difficult.

Post-nasal catarrh

The remaining subjective symptoms are of less importance. The sufferer may be troubled by an accumulation of mucus at the back of the throat, although all signs of catarrh are frequently absent.

Cough

A reflex, barking, dry cough is occasionally observed. Less often there is a chronic rhinorrhœa from the anterior nares, which may produce some excoriation of the lips, etc. Finally, there is more or less general disturbance of nutrition. The child is sometimes

Anæmia

anæmic. He is stupid to a degree greater than can be accounted for by the deafness, often very slight. Some of these symptoms have been referred to among

Aprosexia

those due to polypus. Guye applied his term *aprosexia* equally to the sufferers from adenoids. And although cases undoubtedly occur in which the intellect brightens to a remarkable degree after removal of the obstruction, yet there are as many striking exceptions. Yet I have one striking case on my books of a boy brought up in South Africa, ten years of age, and the picture of health, who, in spite of the most painstaking perseverance on the part of his parents, had never been able to learn to read. His only complaint was that the boys at school laughed at him for always having his mouth wide open; the only other symptom was nocturnal snoring. Four weeks after removal of the growths the father wrote to me saying that the boy had, since the operation, taken to reading in the most astonishing manner. It has recently been asserted that nearly all idiots and imbeciles are mouth-breathers and snorers, while many are deaf;[1] but a recent visit of myself and Mr. F. G. Harvey to Earlswood, thanks to the courtesy of Dr. Robert Jones, convinced us that mouth-breathing, etc., is not much more prevalent there than among the sane.[2] Beyond this stupidity the child is peevish, reluctant to play, and disinclined for exercise. He takes cold in his chest, we are told, upon the slightest provocation, while he eats capriciously, and his digestion is variously disordered. Rarely, there is more or less complete loss of olfaction in cases where the obstruction is exaggerated.

Case

Olfaction

Last of all, it must be carefully noted that there may be no subjective symptoms whatever.

All symptoms may be absent

Passing on to objective examination, it may be well, in the first place, to dismiss the auditory. On inspecting the *membrana tympani* we find almost invariably evidence of ear-disease, even in those cases where there is no appreciable deafness. The most typical appearance is a greater or less degree of

Examination of ear

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[1] "On some Causes of Backwardness and Stupidity in Children," etc., by W. Hill, M.B., *Brit. Med. Journ.*, September 1889, p. 711.

[2] For the statistics of our examination see Appendix, p. 367.

Drum-skin

depression of the drum-skin. The *manubrium mallei* is foreshortened, and sometimes almost invisible. Posteriorly, we may possibly get a view of the long process of the incus, and more rarely the *processus gracilis* is seen in the anterior segment. The surrounding membrane is variously affected, according to the duration of the post-nasal obstruction. It is usually, though not invariably, thickened. When fairly normal in this respect, it sometimes appears more depressed than the manubrium, which stands out with an abnormal prominence. The membrane is not infrequently dull in lustre; the bright spot, which, in a state of health, radiates from the tip of the manubrium downwards and forwards, being more or less obscured, broken, or altered in situation. Beyond thickening and opacity, the drum-skin is sometimes congested, although seldom sufficiently to give rise to pain. The great depression, however, is the pathognomonic symptom; for, from its presence alone, we may, in children, be sure of the existence of post-nasal growths. The most probable explanation of this depression is to be found in the fact that the oxygen in the tympanum is exchanged for carbonic acid; and when this latter is dissolved in the mucus, we have a certain amount of the pressure removed. The external atmosphere, being precluded from entering the Eustachian tube, exerts its pressure on the drum-skin and drives it inwards. Occasionally, though not often, the chief trouble is an otorrhœa, in which case we recognise a perforation of the membrane, with the formation of granulation tissue, etc. Even in these cases, judging from the results of treatment, the post-nasal growths must be considered the most important factor.

Its great depression pathognomonic

Buccal respiration

Continuing the objective symptoms, the buccal respiration attracts the attention of the most casual observer. The lower jaw hangs down, the mouth is open, while the lips are prominent and expressionless, through partial abolition of function in the *orbicularis oris*. When a good light is thrown squarely on the face, we see a little depression on each ala of the nose, situated at the angle between the superior and inferior lateral cartilages. This apparently insignificant symptom is, as matter of fact, quite pathognomonic either of the present or former existence of post-nasal adenoids; for it is seen in no other cases of nasal obstruction. Besides this dimple the nostrils appear unusually narrow; and so strikingly is this marked sometimes, that one cannot but presume it to have antedated the development of the neoplasms. The contrast of the small nostrils and narrow alæ with the bulk of the nose is so great that the bridge appears to have an unnatural width. Probably the collapse of the alæ and the dimples are both due to one and the same cause: from the inability to breathe through the nose, its functions fall in abeyance; the dilators of the alæ lose their tone, and the nostrils collapse. Correspondingly, the portion of this wall least supported will fall in the most conspicuously, which portion is the angle between the superior and inferior lateral cartilages; and the immediate consequence of its loss of support is the formation of the dimple just mentioned. But the lack of use on the part of the nose is scarcely sufficient to account for the extreme narrowness of the nostrils sometimes encountered; and it is possibly one of those sources of anterior nasal stenosis which lead to that lowering of the barometric pressure, which terminates in post-nasal hypertrophy. Partly as a consequence of this curious physiognomy, partly on account of the deafness, and partly from a certain amount of actual intellectual ineptitude, the patient

Appearance of *alæ nasi*

Stupid aspect

presents a strikingly stupid appearance. Dr. Scanes Spicer, formerly my clinical assistant, now physician to the Throat Department of St. Mary's Hospital, has drawn attention to the, as he considers it, frequent presence of an enlarged transverse nasal vein, seen at the root of the nose, with overfilling of the neighbouring superficial veins, in children the subjects of post-nasal growths or catarrhal troubles in the nose. He asserts that it is produced by obstruction to the venous outlet through the spheno-palatine foramina and pharyngeal collaterals.[1] What may be interpreted thus is doubtless occasionally observed; but it is by no means common.

Enlarged transverse nasal vein

The interior of the nose, in a large number of patients, appears abnormally small, and that apart from the frequently observed deflection or thickening of the septum on one side or the other. The fossæ are especially liable to be contracted when the arch of the palate is abnormally high. We sometimes observe hypertrophy or vascular turgescence of the inferior turbinated, but never, as far as my observations go, polypus or disease of the middle turbinated.

Contracted nasal fossæ

Appearance of pharynx

On examining the pharynx, the appearances are almost as striking as those of the physiognomy. The tonsils are often, though by no means invariably, enlarged. It may advantageously be pointed out in this place that probably enlarged tonsils never of themselves induce buccal respiration; this being always due to the concomitant post-nasal growths. Tonsils are sometimes observed large enough to meet in the middle line, although the mouth is held closed without any inconvenience. Even when the tonsils are not hypertrophied, there is generally a peculiar appearance

Tonsils

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[1] *Brit. Med. Journ.*, 27th August 1887.

Congestion of velum and pillars

of congestion in the mucous membrane of the soft palate, uvula, and pillars. The colour is distinctly dusky, the margins have lost their sharpness of outline, being rounded and flabby, while the uvula is swollen, somewhat œdematous-looking, and frequently twisted to one side or the other, due probably to an enfeeblement of the muscular tissue on the opposite side. The palate is often thoroughly paretic, refusing to respond to tactile stimulation. This condition is especially marked in long-standing cases, which consequently generally permit a post-rhinoscopic view to be obtained. On the posterior wall of the pharynx more or less mucus, sometimes frothy, is often seen flowing from the post-nasal region; sometimes the discharge is muco-purulent. Occasionally it is necessary to wash it away with a post-nasal syringe before a view of the growths can be obtained. The posterior wall of the pharynx, as seen without any artificial assistance, is generally more or less granular in appearance; but the granulations share the surrounding aspect. They appear congested, somewhat œdematous, and frequently paler than the surface on which they lie. In this they distinctly differ from the aspect of an ordinary granular pharyngitis. Moreover, they are more symmetrically arranged, becoming distinctly larger as they ascend behind the soft palate. Here they sometimes attain a considerable size, and are then directly continuous with the growths in the post-nasal space, with which they are obviously identical in structure. Rarely one discovers a *pharyngitis sicca*, which, in the absence of a *rhinitis sicca*, is apt to confuse the diagnosis. But in such cases we find the growths confined to the upper part of the naso-pharynx, obstructing, in fact, the superior and middle meati. Respiration is not buccal, but the air, being conducted through the inferior meatus

Uvula

Granular pharynx

Pharyngitis sicca

alone, is not sufficiently moistened, and desiccates the mucus on the posterior wall.

Examination of growths with mirror

Proceeding now to the inspection of the growths themselves, we have two methods at our disposal, either of which is equally satisfactory: the one is afforded by obtaining an image of the neoplasms in the post-rhinal mirror, and the other by digital exploration of the cavity in which they lie. The use of the mirror has already been sufficiently discussed. The portions of the post-nasal space to be especially investigated are the posterior wall, the vault, and the upper limit of the choanæ. Indeed, the last is the best region to examine in the first place; for a mass of growth will not infrequently be discovered encroaching upon the region of the superior turbinated when, but for this fact, it might be overlooked. The upper part of the posterior wall and the summit of the vault are the parts chiefly concerned in the production of the growths. They are seen usually in the form of an ill-defined cushion swelling out from the posterior wall, and reaching its greatest prominence in the middle line at the highest point, thus encroaching upon the upper margin of the choanæ, as has been just mentioned. This gradual sweep of the single mass of growth is the most probable explanation of their being so frequently overlooked even by experienced observers; while, seeing that almost every published illustration represents them as hanging down from the vault like bunches of grapes or as separate pedunculated growths, appearances scarcely ever met with as a matter of fact, it is no wonder that the beginner in posterior rhinoscopy so often fails to detect them. Next to the cushion-like appearance, the most usual aspect assumed is that of coarsely lobulated masses, sometimes one on each side of a central vertical depression. In these cases also

Situation of growths

Appearance in mirror

Usually appear like a single cushion or two or three lobes they assume their greatest prominence at the highest point and towards the middle line. Lastly, they may be seen as ill-defined separate growths covering the whole of the posterior wall, becoming more prominent above, where, opposite the choanæ, they present an irregularly broken outline. When consisting of several separate growths, these may yet be so closely packed together, that they present the aspect of a single, obscurely lobulated mass. The appearance represented in most text-books, as has been remarked, is rarely or never seen. Such illustrations have apparently been copied one from the other with slight modifications rather than drawn from clinical observation. The chromo-lithograph (Fig. 5 on the Frontispiece) gives a good idea of one form; while the even commoner appearances are admirably represented in the accompanying woodcuts (Figs. 55 to 59). They are drawn from life by my colleague, Mr. Procter Hutchinson. Occasionally, when we have a single mass of

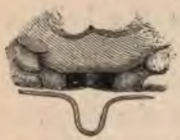

FIG. 55.—Post-nasal growths as seen in the mirror.

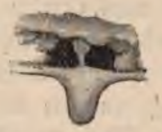

FIG. 56.—Post-nasal growths causing partial obstruction.

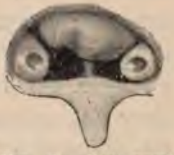

FIG. 57.—Post-nasal adenoids.

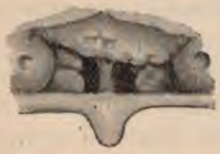

FIG. 58.—Post-nasal adenoids with tumefaction of the turbinated bodies.

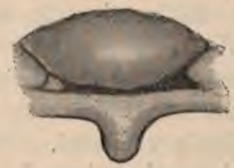

FIG. 59.—Cushion-like mass of adenoids causing profound obstruction.

growth projecting from the middle line, we see little bridges of greater or less thickness extending from the margin of the neoplasm to the posterior lip of the Eustachian tube on one or both sides. They break down easily under the finger, and are apparently of the same nature as the adenoid tissue to which they are attached. By what process the adhesion takes place it is impossible to surmise. The growths are never, in my experience, seen attached to any other regions than those mentioned, except that they are occasionally seen in Rosenmüller's fossa. Here they generally occur in adults with whom the bulk of the growths has undergone atrophy. Yet, though in younger cases they are not seen in this depression, they not infrequently can be felt with the finger to be filling the space. The growths are never seen or felt attached to the septum, palate, or turbinated bodies, as asserted by some observers. The mistake has probably arisen in such cases as one sent me by Mr. T. A. Richardson, of Croydon, where posterior hypertrophy of the inferior turbinated coexisted to such an extent that the post-nasal space was almost completely occluded. The two forms of growth appeared identical in colour, density, and surface; and it was only after the removal of the adenoid growths that the true nature of the additional obstruction could be identified.

Attachment to Eustachian tubes

Rosenmüller's fossa

See p. 267

Colour

The usual colour of these adenoids is a pale, sometimes pinkish gray, duller and less translucent than polypus, and lighter in shade than the mucous membrane to which they are attached. Sometimes, however, they are darker in colour than the mucosa in a condition of health. The surface is never granular, though sometimes coarsely lobulated; nor are there ever seen vessels on the surface, as frequently happens

Surface

with retro-nasal polypi. In adults, where the growths have undergone partial atrophy, we may sometimes see them as distinct excrescences studding the posterior wall, the vault, and even the lips of the Eustachian tubes.

One other method of direct inspection is by means of Zanfal's long anterior nasal speculum. Its value is somewhat problematical, while its employment is painful, and can seldom be necessary to a diagnosis.

Digital examination

Proceeding to digital exploration, certain precautions are, in the first place, advisable, especially for one not expert in making a rapid examination; for if the finger is held too long in the pharynx, it may occur to the patient, especially if a boy of twelve or fourteen years, that he will put an end to the discomfort by closing his teeth. Therefore, it is well to wrap round the proximal part of the first finger a handkerchief or tongue-cloth, not permitting the folds to be of sufficient thickness to interfere with the insertion of the finger to its fullest extent. A long forefinger is essential to the success of the exploration. Standing upon the right side of the patient, with the left hand lightly resting upon his head, so as to be able to grip it firmly if necessary, the forefinger of the right hand, the palm directed upwards, is then rapidly thrust on to the posterior wall of the pharynx, so as to bring it immediately behind the right posterior pillar of the fauces. The finger, on being rotated upwards, will then easily pass behind the velum; whereas, if it be thrust in the first place behind the uvula, considerable difficulty may be encountered in reaching the cavity above. As soon as the finger is well in the space, the presence or absence of growths is at once realised, though, on making the examination for the first time, the freedom from obstruction is more immediately

Method

Growths soft and yielding

realised than the existence of growths. This is accounted for by the fact that the consistence of the adenoids is so soft and yielding that the novice cannot feel sure of the slight impression they afford. In cases of doubt the septum should be sought, and the finger passed upwards from that point. If this is effected, there can scarcely remain any doubt when the growths are encountered at the upper part. The impression they yield to the finger is best described by likening it to that of a varicocele, or the conventional bag of worms, though adenoids are of even softer consistence than the varicocele. Examination with the finger is generally attended with a certain amount of hæmorrhage, although no more than is sufficient to cover the finger; and this fact alone is a help in cases where we are not quite sure as to the diagnosis. In cases where the neoplasm consists of a denser fibrous mass attached to the posterior wall, the impression is quite different. In this case the finger encounters an obstructing ridge which may prevent access to the upper part of the choanæ.

Or dense

Comparison of the two methods

Comparing the respective value of the two methods of examination, it must be impressed upon the reader that post-rhinoscopy is seldom of any avail in the case of children, with whom it is useless to persist in the attempt if not in the first place successful. Moreover, with the mirror it is exceedingly difficult to form any correct idea as to the actual amount of the obstruction. The post-nasal wall being perhaps completely covered with the new growths, it is not possible to estimate the depth to which they extend: whereas, the finger soon learns to realise the quantity as well as the consistence of the growths; for sometimes they are exceedingly soft, while in others they are firm and fibrous—a point in diagnosis important in determining the most advisable course of treatment.

Finger alone can estimate quantity

Of concomitant conditions, the most important are the coexistence of enlarged tonsils, chronic pharyngitis, and laryngitis, various forms of chronic rhinitis, and lastly, the contraction of the thorax known as pigeon-breast, resulting from the disturbed equilibrium between the external and intra-pulmonary air-tension. The explanation of the phenomenon was first correctly given, according to Dr. West, by Shaw in 1841. Dupuytren, however, was the earliest to draw attention to the association of the condition with enlarged tonsils;[1] and until quite lately it had been supposed that the tonsils alone were responsible for the contraction. But we frequently see tonsils enormously enlarged without any buccal respiration, and we may hence assume that the coexistence of post-nasal growths is necessary to that lowering of the intra-pulmonary air-pressure which leads to the formation of pigeon-breast. But, as yet, I have not observed the latter condition where the growths existed without the enlargement of the tonsils at the same time. Altogether, pigeon-breast is only occasionally seen, and the question cannot yet be considered settled.

Concomitant conditions

Pigeon-breast

Pathologically, these growths consist of lymphoid tissue, and are nearly identical in structure with the tonsils. The tissue is spoken of frequently as adenoid, after the nomenclature of His; but seeing that, wherever situated, it has no claim to a glandular function, the term is somewhat inappropriate. The tissue consists of a retiform connective tissue, the trabeculæ of which are formed of ramified corpuscles, which may or may not retain their nuclei; the network is so stuffed with lymph-corpuscles that a section, without previous pencilling, is indistinguishable from granulation-tissue. The post-nasal growths are richly supplied

Pathology

Adenoid tissue

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[1] *Diseases of Infancy and Childhood*, by Dr. West, 1874, p. 593.

with blood, and are covered with a layer of ciliated epithelium. The pathological anatomy of these adenoids throws no light upon their ætiology; the most that can be asserted, from microscopical investigation, is that they consist of a tissue which everywhere evinces a strong tendency to augmentation in bulk upon very slight provocation. So that any source of increased blood-supply, whether due to the physical conditions already discussed, or to merely inflammatory congestion, will be sufficient to account for them. When removed from the body they are found to be variously fissured and coarsely lobulated, presenting great variety in size and shape (Fig. 60). In cases of long standing, large quantities of fibrous tissue become developed round their attachments, ramifying into the substance, and diminishing towards the periphery.

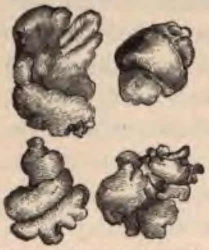
FIG. 60.–Post-nasal growths after removal from Case 24. They weighed 123 grains. Examined with the post-rhinal mirror they had exactly the appearance represented in Fig. 55.

The diagnosis presents no difficulty whatever. There are very few affections for which post-nasal growths can be mistaken; and, practically, errors never occur. The age of the patient generally precludes the possibility of polypus extending from the nose into the Diagnosis naso-pharynx. In the latter case we should most probably be successful in obtaining a post-rhinal view, in which case the transparency of the tumour, From polypus the enlarged vessels on its surface, the difference in colour, will all declare the true nature of the structure in question; whereas the mobility upon a digital exploration, and the freedom from the posterior From fibroma wall, will prevent all possibility of error. Fibrous tumours of the naso-pharynx often generally make their appearance about the same age as adenoids, though the fact need not in any way confuse the diagnosis. The fibrous growth is hard and resistant, bleeding easily and freely, purple or red in colour, perhaps with large vessels on the surface. There may be, moreover, frequent and severe epistaxis, great pressure on the palate and Eustachian tubes, and, in old-standing cases, distortion of the neighbouring parts.

From inferior turbinated

See p. 262

Posterior enlargement of the inferior turbinateds may possibly obscure the diagnosis, as in the case already referred to. And in this case the full diagnosis could not be elucidated until the growths had been removed. However, the enlargement of the whole length of the inferior spongy body, increasing to true hypertrophy as the pharynx was approached, rendered the diagnosis, which subsequently proved correct, probable if not positive.

Prognosis

The prognosis of post-nasal growths is highly satisfactory from the point of view of treatment, and, in a more limited sense, in the natural course of their history. That is to say, a certain, perhaps large, number of cases are attended with no symptoms whatever, and, as the patient approaches puberty, there would appear to be a tendency to spontaneous improvement. This, however, has probably been overestimated in its importance; for that the worst cases very frequently present themselves after puberty is well established. Thus forty-one males and twenty-two females of my cases were over sixteen years of age. Some authors hold that it is rather the widening of the cavities that takes place at this period than the actual shrinking of the growths that is responsible for the increased freedom in breathing. The prognosis, when there are definite symptoms requiring alleviation, depends upon the age of the patient and the duration

Depends upon age and duration

of the symptoms. Thus, when there are grave ear-troubles, the result of the prolonged presence of the post-nasal obstruction, in an adult; when there are otorrhœa and serious middle-ear mischief; or when there is a chronic pharyngo-laryngitis; we must give a more guarded prognosis than in the case of younger patients, where the symptoms have not persisted for any length of time. Some authorities consider it advisable, in the event of the patient being about fourteen or fifteen years of age, and the symptoms

Indications for operation

no more than might result from obstruction of the Eustachian tube, to postpone operative interference, in the hope that the condition will ameliorate spontaneously. This would doubtless be commendable if the symptoms were not of great importance, and were liable to occasional spontaneous improvement. In like expectation, it is probably unnecessary to operate where the patient is in good health, and the only inconvenience is the snoring or the buccal respiration; for the operation has doubtless certain risks, if only those of the anæsthetic. But where there is general malnutrition and anæmia, where there is interference with respiration and the thorax is contracted, where there is increasing deafness, post-nasal catarrh, laryngitis, laryngismus, or restlessness, the operation may be performed with the best prospects. In the case of epilepsy or asthma, of course, a guarded prognosis must be given, though fair hopes may be entertained if the obstructed breathing is clearly connected with the onset of the attacks.

Treatment

The treatment may be divided into two headings — medical and surgical. The only class of remedies affording the slightest hope of benefit are those comprised under the term "astringents." The

Medical

method adopted by Dr. Urban Pritchard affords, in a certain number of cases, a ready means of diminishing the bulk of the growths to a certain extent. It appears to be specially likely to do good in those cases where the obstruction is not severe, and where the growths are soft and associated with a catarrhal condition. He directs that a lotion of glycerine of tannin is to be syringed along the inferior meatus into the post-nasal space night and morning (Form. VIII.)[1] In a few cases I have found striking improvement follow a course of this treatment, if extended over two or three months; yet, in the majority of cases, I have been disappointed. Insufflations of astringent powders behind the soft palate are scarcely applicable in the case of children, while in adults the growths are generally of so fibrous a structure that no hope of their absorption could be entertained.

Surgical

Scarifying

Ablation

Surgical treatment, according to the method adopted, has two main objects in view. Attempts are on the one hand made, in one manner or another, to diminish the bulk of the growths by scratching and scraping their surfaces, so as to make them bleed freely; while, on the other hand, the growths are removed bodily. The advantage of complete removal is that there is small likelihood of any recurrence, while the former procedure has been abandoned by many experienced operators because of the frequence with which a second or even third operation is demanded. The risks of the two methods appear to be about equal, and altogether inconsiderable. The advantage of restoring nasal respiration is apparently ignored by those who are satisfied with temporarily alleviating some of the symptoms. In the belief that the complete removal of the growths is the only scientific procedure, the methods of effecting this will be described in the first place.

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[1] *Handbook of Diseases of the Ear*, 1886, p. 97.

Forceps

Loewenberg's

Hovell's

The best instrument for the purpose is a modification of Loewenberg's forceps (Fig. 61). The precision, rapidity, and accuracy with which these can be used has rendered the many varieties, for the most part, superfluous. But the cutting edge should be confined to the posterior and upper edges of the spoon-shaped extremities, else there is some danger, especially when no anæsthetic is employed, and the finger cannot consequently be used to guide the instrument, of gripping the mucous membrane on the upper surface of the soft palate, or even of seizing and fracturing the vomer. The best modification of the instrument is that of my colleague, Mr. T. Mark Hovell (Fig. 62), in which the cutting edges form a complete circle and overlap, so that they act punch-like. The object of this instrument is to avoid tearing the mucous membrane unnecessarily, by cutting the growths out in a number

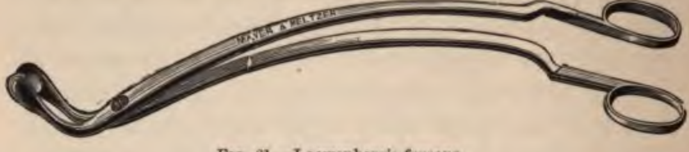

FIG. 61.—Loewenberg's forceps.

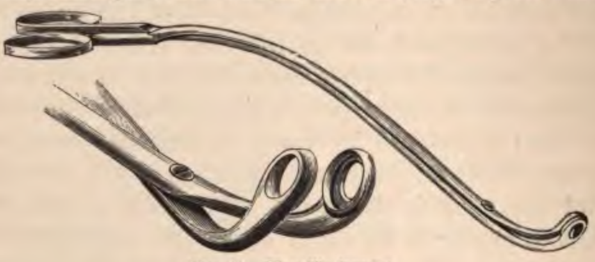

FIG. 62.—Hovell's forceps.

of small pieces.[1] My objections to it are the increased risk of hæmorrhage with a clean-cut wound, especially in the event of there being in the seat of operation an abnormal branch of the ascending pharyngeal artery; next, the increased length of time inevitably occupied; and lastly, that, with reasonable care, there is no risk, in using the ordinary forceps, of stripping off healthy mucous membrane. Mr. Hovell believes that the danger of a subsequent otitis is dependent upon this accidental tearing; but, as will be presently shown, other causes are more likely than this to produce the ear-trouble occasionally observed.

Chloroform preferable to ether

Whenever possible, chloroform should be administered in preference to ether, seeing that the latter produces congestion in the mucous surface, and so increases the amount of hæmorrhage. Upon this point most operators are agreed. The shoulders should be slightly raised and the head inclined backwards, so as to permit of the blood flowing backwards rather than into the pharynx. Next, the mouth must be held open with a suitable gag, such as Mason's, held in the left side of the mouth by the anæsthetist. Then, with the forefinger of the left hand in the naso-pharynx as a guide, the dorsum of the hand looking downwards, the hand being rotated inwards on itself, the operator standing on the right side of the patient's head, the forceps are thrust behind the velum, and the growths removed piece by piece. The forceps should, in the first place, be opened wide to include as large a portion of growth as possible. When at all resistant, the finger should be pressed down on the adjacent surface to avoid tearing up the mucous membrane; this should be repeated as the growth is detached from each point.

Position of patient

And of operator

Avoid tearing the membrane

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[1] *Brit. Med. Journ.*, March 1888, p. 474.

Sometimes so firm is the attachment that considerable twisting and tearing is necessary before the piece can be removed. After the first few large portions have been extracted, several smaller usually remain. The finger must search for these, and the forceps must be directed accordingly. Working in this cautious and at once rapid manner, every particle can be removed without any risk. Nevertheless, it is probably never essential that every smallest excrescence should be removed. The one point essential to success and safety, is that each portion of the neoplasm should be felt with the finger and placed in the grip of the instrument as it were. Without this precaution it is quite possible to fracture the vomer, as once occurred to myself in an early operation; or to strip the whole pharynx of mucous membrane, as once happened in the hands of one of my clinical assistants.

The finger to direct the forceps

After removing the bulk of the growth with the forceps, a certain amount may still remain that is inaccessible to the instrument. Such is found especially in Rosenmüller's fossa, and can be generally scraped out with the finger-nail. In this situation the excrescences are never very fibrous. The same remark applies to a remaining fringe, often left in the most anterior portion of the site from which the growths spring. Unless carefully searched for, it may hang down in front of the choanæ, and still considerably obstruct nasal respiration. But this remnant can always be removed with the finger at the termination of the operation. In a similar manner the operator must guard against a pendulous portion lying concealed in the superior meatus, into which it may have been inadvertently thrust. It can easily be withdrawn with the finger and removed with the forceps.

Some portions inaccessible to forceps

Portions may escape into fossæ

Hæmorrhage

Sponging

Some deprecate hanging position of head

The hæmorrhage is sometimes rather profuse, but never, in my experience, sufficient to demand the exhibition of styptics. Rarely, where presumably an abnormal branch of the ascending pharyngeal has been severed, it may be necessary to plug the posterior nares. During the operation it is advisable to sponge out the pharynx as often as a portion of the growth is removed. The best sponges measure 3 or 4 inches in length, by 2 or so in thickness; these are easily inserted with the fingers, pushed well into the pharynx, and withdrawn. A sponge that can be carried in a holder is not large enough to be of the slightest use, seeing that the bleeding may be very profuse for a few minutes. As the sponge is thrust into the pharynx, if the head is well thrown back, a flow of blood is generally forced from the nose; this should be immediately wiped away before withdrawing the sponge, so as to prevent it returning into the nose and throat. The only possible risk from the operation is that of the patient drowning in his own blood—a possibility that can scarcely be realised. Mr. Hovell, who has perhaps operated upon a larger number of patients in this country than any one else, objects to the head hanging backwards, arguing that thereby venous engorgement is favoured. But in either position the hæmorrhage may be smart, and probably the hanging position is the safer. It is advisable, as soon as the operation is completed and the gag removed, to turn the patient on his side, so as to allow the blood, if still flowing, to obtain an exit from the nose. The hæmorrhage ceases almost immediately with the operation.

Since the first edition of this book was published I have adopted with some advantages an alternative

Alternative position of patient

position for patient and operator. The patient is held by an assistant on the side and facing the operator, who sits on a stool of such a height that his hands are on a level with the patient's head. The operation is then proceeded with as described above. The main advantages of this position are (1) that, the blood flowing from throat and nose, the pharynx needs no sponging; (2) that the finger need not be removed from the naso-pharynx until the operation is completed; (3) that very little blood is swallowed, the subsequent vomiting being considerably lessened; and (4) that there being no sponging and consequent ecchymosis, there is less soreness afterwards. The only disadvantages are that the operation is not so easy at first as with the patient on the back, and that the operator is occasionally spattered with blood, the anæsthetist, however, being correspondingly protected.

Operation without an anæsthetic

When operating without an anæsthetic, as may sometimes advantageously be done in the case of adults, it is generally preferable to effect the eradication of the growths in the course of two, three, or more sittings. In this case the patient sits upright before the operator, who reflects the light into the throat in the usual manner. If the palate will permit, the first piece or two can be seized with the help of the post-rhinal mirror; but, after that, the bleeding renders this impossible; so that the sense of touch, transferred as it were to the extremity of the instrument, must be trusted. While proceeding in this manner, frequent examination must be made with the finger to ascertain the progress made. But so little does cocaine in any safe dose affect the sensibility of the post-nasal region, that it is seldom of much use; while in the case of children it is of course inadmissible. Few patients will permit of the completion of the operation without an anæsthetic at a single sitting.

Scarifying and scraping operations

Nitrous oxide

Instruments

Objections to these operations

In attempting to operate by means of the many devices for scraping the growth away, the method of procedure is somewhat modified. The patient is placed nearly upright in a dental chair with a basin between his knees. Nitrous oxide is administered, the finger or instrument inserted, and the neoplasms are freely scarified. As soon as the operation is commenced, however, the patient's head is carried forwards, so as to bring it over the basin, into which the blood flows from the nose. By this means all risk of the blood passing into the air-passages is obviated. The instruments employed in this operation are various. The most common is the nail of the right forefinger, kept long for the purpose. A modification of this is an artificial nail attached to a ring fixing on to the first joint of the finger (Fig. 63). Next there are various forms of ring-knives; the straight one of Meyer (Fig. 64) inserted through the nasal fossæ from the front; the antero-posterior form, inserted from the pharynx, as adopted by Sir William Dalby; and the lateral instrument of Hartmann (Fig. 65), which confines its action to the posterior wall. The great objection to most of such instruments is the risk of wounding the Eustachian tubes; this especially applies to any form of antero-posterior ring-knife. A very limited use of such apparatus has con-

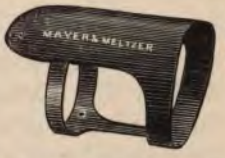

FIG. 63.—Dalby's artificial finger-nail.

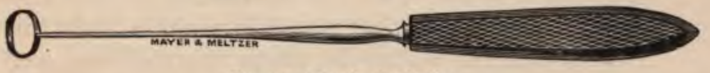

FIG. 64.—Meyer's ring-knife.

vinced me of the difficulty in eradicating the growths, as well as of their inferiority in accuracy as compared with the forceps first designed by Loewenberg.

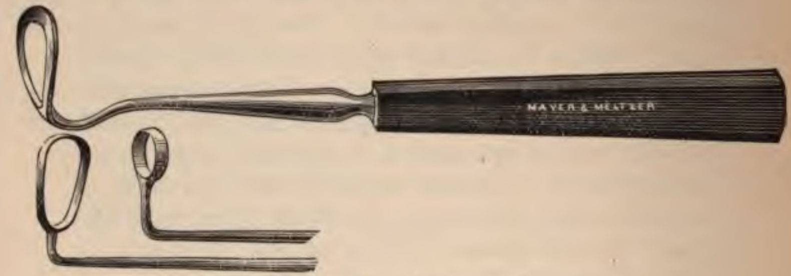

FIG. 65.—Hartmann's and Dalby's ring-knives.

Bosworth strongly recommends a method he has devised for snaring these growths. He employs a Jarvis snare with a longer barrel bent two inches from the extremity at a right angle. A projecting loop of the required size is bent backwards away from the operator so as to give the wire a decided kink; the wire is then played out an eighth of an inch, and a second kink given to it in the opposite direction so as to bring it in line with the termination of the instrument. The loop is then placed in position behind the velum, which on contracting grasps only the instrument, leaving the wire free in the post-nasal space. On withdrawing the wire-loop the backward kink throws it strongly on to the posterior wall, thus increasing the chance of its grasping the growth firmly. In this manner Bosworth claims that a broadly sessile tumour is easily extirpated with little hæmorrhage or pain. After withdrawal of the instrument, the growth is expelled through the fossæ by blowing the nose. He also claims that by this means an anæsthetic is rarely required.[1] Hartmann advocates a snare in which the loop is concealed in a fixed ring, thus facilitating introduction; but Bosworth's plan is likely to be more successful.

After-treatment

The after-treatment is of some little importance. The temperature occasionally rises the first evening, but seldom after; while sore throat is only exceptionally complained of after the first day, except when the operation has been clumsily performed, and the palate unnecessarily ecchymosed, or the pharynx stripped of its mucous membrane. Forty-eight hours in bed with slop-food is the only treatment required. **Washing** The snoring may possibly be worse for the first two or three nights, and only begins to improve when the nose is washed with *lotio alkalina* and cleared of the stagnant blood-clots and the thick tenacious discharge which soon begins to form. Possibly the wound is best left at rest for a couple of days before the cleansing is commenced. **Improvement in symptoms on third or fourth day** After the third or fourth day improvement rapidly and strikingly begins, although the hearing may be further delayed until the Eustachian catheter or Pollitzer's air-douche can be safely employed. It is safer not to employ these too soon after the operation, for fear of driving blood or secretion into the middle ear. There is one point in the after-treatment of these cases that demands the closest attention. **Inspection of drum-skins** The tympanic membranes should be carefully inspected daily until convalescence is thoroughly established. For, occasionally, though very rarely, even while the hearing is notably improved by the operation, a slight suppurative otitis is developed. **Otitis** This may occur on the second, third, or fourth day after the operation. Pain is sometimes complained of, though not always;

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[1] *Diseases of the Nose and Throat*, New York, 1889, p. 565.

while the only objective indication of the mischief is a small perforation of the membrane. This mishap is due, in all probability, to blood entering the tympanum during the operation; when, as the consequence of the removal of the obstruction, the tubes are opened, and the blood is forced in by greater pressure of the external air. The same thing occasionally happens after See p. 317 a simple epistaxis; and I have witnessed it more frequently after the removal of nasal polypi than after the extirpation of post-nasal growths. So that the entrance of blood is probably more likely to produce a suppurative otitis than the unnecessary stripping of the mucosa as suggested by Mr. Hovell. In the few cases of otitis I have seen, no harm has resulted. The perforation has readily healed in every case almost as though it were traumatic, leaving no trace of its existence. No treatment is necessary beyond that of keeping the meatus clean with boric lotion. If there Ear-ache is ear-ache, counter-irritation may be employed in the form of a blister or mustard-leaf behind the ear. But, although apparently of small consequence, the failure to recognise the possibility of the accident might be very damaging to the operator's reputation.

Anterior obstruction to be treated

In the course of the subsequent treatment it must be remembered that it is common to find some other form of nasal obstruction in conjunction with post-nasal growths, in the shape of turgescence or hypertrophy of the inferior turbinated, deflections and hypertrophy of the septum, etc.; and that, in consequence of the presence of these, the buccal respiration may persist, although the snoring invariably ceases as soon as the post-nasal obstruction is removed. Apparatus for holding mouth shut Hence the questionable propriety of using any apparatus for artificially closing the mouth, such as caps and straps, strongly recommended by many authorities. Instrumental closure of the mouth is as cruel as unscientific; for nasal respiration is almost invariably adopted as soon as it is rendered possible. If the child still goes with the mouth open, some further source of difficulty must be sought and remedied.

Faulty speech

The most troublesome symptom to overcome is the faulty speech. The child, having often learned to speak with the post-nasal region closed, persists, after the normal condition is restored, in producing his consonants in the manner to which he is used. Having, for instance, always made Bs of his Ms, and Ds of his Ns, he perpetuates the error of inopportunely closing his post-nasal space. But whereas, before the operation, correct speech was an impossibility, afterwards it needs only careful instruction to render it habitual. This re-education is a much more difficult matter with adults than with children, for obvious reasons. For the former especially, the best method of securing success lies in the hands of a skilful trainer in the science and art of voice-production. But the impostors are so many, and the rational teachers so few, that this is not always an easy matter. The palate may be strengthened by such means as frequent gargling with cold water. If the patient sings, he should be advised to use head- and falsetto-notes as much as possible. By these means the levators of the palate and the superior constrictor are thrown into action. In long-standing cases, where the palate appears actually enfeebled by prolonged disuse, good results may be anticipated by applying Faradism to the muscles at fault.

Voice training

CHAPTER XIII

TUMOURS OF THE NASO-PHARYNX

1. Fibromata. 2. Fibro-mucous Polypi. 3. Enchondromata.
. 4. Malignant Tumours.

1. *Fibromata.*

Fibrous polypi rare

FIBROUS tumours of the naso-pharynx are fortunately of very rare occurrence. Thus Sir James Paget tells us that he has never had opportunity of examining a fresh specimen of the growth. They occur almost entirely in young people rarely over twenty-five and never younger than ten years; and they are confined to the male sex. The initial step in the rapid formation appears to take place at the first dawn of puberty. Absolutely nothing is known as to their ætiology; and consequently the many theories as to their nature are more or less worthless.

Site

The most frequent site of their attachment appears to be the base of the body of the sphenoid, though subsequently they may form extensive adhesions to any regions in the nose or its numerous accessory cavities.

Spontaneous cessation of growth

At an age varying between one-and-twenty and five-and-twenty their increase in size is generally arrested, though up to this time it may have been fairly rapid. In one of the only two cases occurring in my own practice, the neoplasm had attained the size of a mandarin orange in the space of a twelvemonth (Case 38), completely filling the post-nasal space in this period. When this rigidly limited space is quite obliterated, the growth is not therefore checked; it advances into the nose, on one or both sides, gains a wider and wider attachment, consequently increasing its area of nutrition and rapidity of advance. Sometimes it sends offshoots into the spheno-palatine and spheno-maxillary fossæ, whence it may even protrude beneath the zygoma. It tends to separate and absorb the outer walls of the nose, thus partly obliterating or extending into the maxillary sinus. The nose becomes widened and flattened, and the eyes correspondingly far apart. Through the spheno-maxillary fissure it may extend into the orbit and further cause a prominence or even protrusion of the eye. Finally, the frontal and sphenoidal sinuses may become occupied and distended, and thus, or through absorption of other portions of the bony framework, the tumour may gain access to the cranial cavity. The physiognomonical consequence of these distortions is the production of what is called *frog-face*. Such a formidable train of symptoms renders an early diagnosis of the greatest import; and probably at the present time, when the incipient stage can be detected with facility, there is small likelihood of the tumours having opportunity of effecting the frightful ravages of which one reads.

Mode of advance

Destructive progress

Frog-face

Subjective symptoms

The earliest symptoms are those of mere irritation of the nasal mucous membrane. The nose persists in a catarrh more obstinately than can be accounted for by an ordinary cold in the head; it becomes obstructed, and the patient snores at night. In fact, we have all the usual symptoms of post-nasal adenoids, except that the disease advances with a rapidity unknown in that affection. Added to this fact, it soon becomes apparent that some more serious malady is progressing. The hearing becomes very seriously involved, while the speech grows curiously thick and, after a time, almost unintelligible. The snoring at a certain point may cease from the pressure on the palate preventing its vibration, and then there supervenes a distinct difficulty in deglutition. From this time the symptoms become more aggravated: the patient has attacks of vomiting perhaps, and, what is more likely to awaken the parents to the fact that there is something radically amiss, there are frequent attacks of epistaxis, sometimes so severe as to necessitate attempts at plugging. It is then that the medical man realises that there is some grave obstruction in the post-nasal space. Another curious symptom, occasionally observed even in the earlier stages, is a strong tendency to fall asleep at any time of the day, and in any position, and sometimes when wakefulness is essential. This drowsiness is said to be accompanied by a feeling of great fatigue. As the case advances still further, neuralgia in various parts of the head may be induced, and a muco-purulent or purulent discharge, sometimes fœtid, takes the place of the mucous exudation. As the tumour extends into the pharynx, dyspnœa may be induced, and this at a comparatively early stage.

Hearing and speech

Vomiting

Epistaxis

Sleepiness

Neuralgia and discharge

Objective examination

When the tumour is seen before much progress has been made, it is found occupying the naso-pharynx alone, a good view of which region can be obtained with the post-rhinal mirror. When further advanced, it may be brought sufficiently into view by lifting the velum with a palate-hook. When seen either by reflection or directly, the tumour is observed to present a smooth, uniform, globular aspect of a colour varying from a pale pink to an intensely dark, purplish-red. Often are seen on the surface large, thin-walled, sometimes varicose vessels, to the rupture of which the hæmorrhage is probably due. An anterior nasal examination can hardly prove of much assistance. In advanced cases the nasal fossæ are found filled with a dark red, fibrous, easily bleeding, and immovable mass. The only other objective sign, beyond the buccal respiration, is the depression of the membranes of the ears.

Colour

Vessels, anterior rhinoscopy

These fibrous polypi of the post-nasal space on microscopical examination present the usual features of ordinary fibromata. The structure is very dense, and there are very few elastic fibres. They are covered with a layer of mucous membrane of varying thickness, in which ramify the thin-walled, tortuous blood-vessels. The latter are less numerous and smaller in the interior, presenting an apparently embryonic structure. Both arteries and veins frequently are so intimately adherent to the fibrous tissue that they do not collapse on section. Thus thrombosis is hindered, and the free bleeding is accounted for. In some specimens a variable proportion of spindle-shaped cells with nuclei is to be found; while occasionally a portion of the growth may present a cavernous structure similar to that of the erectile tissue of the inferior meatus. These fibromata are further liable to various metamorphoses, *e.g.* mucoid degeneration, serous infiltration, calcification, and even ossification. Their surface is prone to ulceration and suppuration, either from friction or pressure.

Pathology

Bleeding

Diagnosis The diagnosis need seldom present any difficulty. A solitary dense neoplasm of smooth uniform surface cannot possibly be mistaken for adenoid growths. Mucous polypi, extending from the nose into the naso-pharynx, never induce such grave symptoms. Sarcomata, occupying the same region, may give rise to some doubt on account of the hæmorrhage; but the softer consistence of these, as well as the age of the subject of fibrous polypus, may assist in the diagnosis. The only case where any difficulty may arise is in that of the growths to be presently described, viz. the so-called fibro-mucous polypi of the naso-pharynx. Unless there is a history extending over a length of time, the only means of making a certain diagnosis of the latter is by the microscope.

Prognosis The prognosis is only favourable for those cases that come under observation at an early period. When the growth has invaded other regions than that of the naso-pharynx it becomes correspondingly inaccessible, and hence unamenable to surgical treatment. The neoplasm shows a spontaneous tendency to the cessation of growth, and even some inclination to absorption. Hence some authorities advocate in bad cases the deferment of surgical interference, at any rate until after the age at which the tendency to increase in size is arrested, seeing that occasionally they disappear without any treatment whatever. Cases are on record, moreover, where the growth has undergone spontaneous cure through sloughing *en masse*.

Treatment In the discussion of the best methods of treatment it is not proposed in this place to enter upon the external operations sometimes necessitated, which are detailed in the text-books of surgery. Those methods only will be passed in review which come specially within the field of the rhinologist. And as a matter of fact, good results may be anticipated only when the disease has not advanced beyond the application of such measures as are afforded by snares, forceps, the electric cautery, and electrolysis.

The simplest manner of operation, when the growth is not filling the post-nasal cavity too completely, is by means of the *écraseur*. This may be effected with a curved instrument passed through the mouth behind the soft palate, or by a straight strong instrument on the pattern of Jarvis's. The latter alternative is probably the more effectual, as through the nose the instrument can more readily be passed up to the root of the pedicle. The method of procedure is as follows:—With a Bellocq's cannula or short Eustachian catheter, a piece of thread is carried into the pharynx through the nose. To the buccal end of this the two terminations of a piece of No. 6 piano-wire, measuring 18 or 20 inches, are attached in such a manner that, on being drawn upwards through the nose, they will not abrade the surface. By means of the thread the ends of the wire are then drawn into the naso-pharynx and nose. As soon as they project from the anterior nares, the bent ends are detached with a pair of wire-nippers, so that the wire can be threaded into the barrel of the *écraseur* to be employed, which is thrust well into the nose before the wire is made fast to the instrument. In this manner a large noose is left in the pharynx, which, with the help of the forefinger, can be insinuated behind the tumour. Once this is effected, there will be no difficulty in working the snare on to the highest portion of the pedicle, tightening as it is advanced upwards. The growth can then be slowly cut through by gradually shortening the wire.

Écraseur

Method of application

This method of introducing the snare into the nasopharynx is preferable to that of carrying the noose directly through the anterior nares and thence into the pharynx, as usually recommended. If this is effectually accomplished, the noose, by the time it reaches the desired spot, is so doubled upon itself, that even if it can be sufficiently opened to pass it over the growth, it is necessarily considerably weakened at the point of duplication. And so dense is the substance of the pedicle that there is always a possibility of its breaking before the section is completed. This constitutes the principal objection to the operation. The incandescent snare is open to the same criticism; for unless a considerable and inconvenient amount of time be devoted to it, any serious tightening of the loop when red-hot is apt to sever it.

Possibility of wire breaking

Evulsion

Evulsion, as adopted in my own case, has doubtless its advantages. With a powerful pair of curved forceps, having coarsely serrated blades, the tumour is seized from the pharynx as near the root of the pedicle as possible, and the latter is torn from its attachment strand by strand. After the bulk of the pedicle has been considerably reduced in this manner, the growth may be seized in the fingers and completely torn away. Yet the operator must be cautioned against using all the force that would, in some cases, be necessary to effect a severance, seeing that cases are on record where serious accidents, such as fracture of the ethmoid, have resulted, the patients dying of cerebral complications.

Excision, etc.

Excision has occasionally been practised with success; but the risk of hæmorrhage is so great that few would lightly undertake it. Chiselling, gouging, and crushing hardly have more reason for commendation.

The method of ligation has its merits, as it is free from any risks of hæmorrhage. It consists in passing a noose round the tumour from the nose, tightening it so as to permit of its sloughing away. The objections are the risk of the mass separating during sleep, and the severe fœtor and suppuration attending the process of necrosis.

Ligation

Escharotics and the actual cautery are doubtless of the greatest service in many cases. But the impossibility of limiting the action of the former to the structure to be destroyed, especially if employed sufficiently to be of any avail, must limit their use to very few cases. On the other hand, the actual cautery, afforded either by Paquelin's thermo-cautery or by the electric current, may be of the greatest utility. Sir Morell Mackenzie relates a method employed by Nélaton, with success, by means of a fine jet of gas-flame applied directly to the stump of the growth after its bulk had been removed. But all forms of actual cautery are now superseded by the galvanic. And either this or electrolysis is probably now considered essential for the destruction of the base of the tumour, in whatever manner it has been removed. Moreover, the galvano-caustic is further necessary for attacking the first appearances of fresh growth. The best plan is to cut through the pedicle of the growth with an incandescent snare, passed over the tumour in the manner already recommended, and then to cauterise the remaining portions by plunging into them the cautery knife. Care must be taken in employing the incandescent *écraseur* that the battery is of sufficient power for a prolonged operation. Dr. Lincoln, of New York, has recorded three cases very successfully treated in this manner.[1]

Caustics

Actual cautery

Galvano-cautery

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[1] *Archives of Laryngology*, 1883, vol. iv. p. 258.

Electrolysis

There remains now only one method to be discussed; and if the general experience proves to be as favourable as that of its advocates leads one to expect, electrolysis, recently so carefully described by the lamented Voltolini,[1] will supersede all the other contrivances for removing these formidable neoplasms. He has devised some new apparatus, of which the advantage he claims consists in the rapidity of operation; for whereas electrolysis, as formerly employed by Von Bruns, Rossi of Rome, Capart of Brussels, etc., would occupy six to twelve months before any substantial advance was made, by his methods the length of the operation is considerably shortened, and a more complete destruction of the tumour results.

Voltolini's instructions

His cutting loop

In those cases where the tumour has formed no attachment to the lateral walls of the pharynx or to the palate—where, in fact, a snare can compass the bulk of the growth,—Voltolini employs what he terms an electrolytic cutting loop. This, contrarily to the method of action with the galvano-cautery, exercises no action whatever if the loop be uninterrupted; for then the current simply passes along the continuity of the wire, instead of traversing the substance of the tumour. Consequently the loop must be interrupted at some point in its course. The most efficient means of effecting this consists in connecting the severed ends of the loop with an insulating knob of ivory. In cases where the neoplasm is so packed into the naso-pharynx that such a piece of ivory would be an impediment to the introduction of the snare, Voltolini recommends that it should be inserted close to the tube in which the wire runs, so as to leave the circumference of the loop quite smooth. On one side of the little knob is a platinum wire soldered on to one conducting tube, so that the wire is shortened by being drawn through the other tube. Beyond this special arrangement of the wire, the ordinary galvano-caustic snare may be used, the wire being fixed and tightened in the ordinary manner. But the tubes conducting the wire must be carefully insulated, else the current will naturally be expended before it reaches the snare. For this purpose they may be covered with a solution of gutta-percha in chloroform, or with gum-elastic dissolved in turpentine.

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[1] *Die Krankheiten der Nase und des Nasenrachenraumes, nebst einer Abhandlung ueber Electrolyse*, etc., Breslau, 1888.

Alternative method

An alternative method of employing the electrolytic loop consists in passing over the tumour an ordinary snare through tubes insulated as described above. The terminations of the wire are to be fastened to the handle as usual, so as to admit of being drawn through the tubes; but the terminations of the handle, instead of being fixed to the two poles of the battery, are both fastened to one—preferably the negative; while the positive pole is attached to a sponge-electrode, which, moistened with water, is then applied to the integument of the back of the neck.

Electrolytic forceps

In cases where it is not possible to include the growth in a snare, it becomes necessary to resort to the ordinary method of introducing needles into the tumour. Voltolini says that the great difficulty in effecting the destruction of the tumour in this manner is that the needles tend to sink deeper and deeper into the substance before the work is effected. To obviate this difficulty, he has designed a pair of electrolytic forceps. At the extremity of the blades of these, on their inner aspects, are fastened a number of platinum points which penetrate into and hold fast the surface of the growth. The blades are insulated with ivory, and the rest of the instrument with a solution of gutta-percha or gum. In cases where the mass cannot be fairly grasped with the forceps, he has constructed a pair with pointed extremities, which can be thrust into the tumour, while the platinum points project from the outer sides. The closed forceps being introduced into the neoplasm and opened, the points gradually work a large hole in the tumour, which is thus destroyed from within. He further advises the employment of weak galvanic currents, seeing that they can be continued longer than the strong.

No hæmorrhage

One great advantage in electrolysis over all other methods of treatment is that it not only causes no bleeding, but actually checks any tendency thereto by causing coagulation of the blood and thrombosis of the vessels. This Voltolini declares to be so true that if, in the employment of electrolysis, hæmorrhage should occur, it is a certain indication that something is out of order in the conduction of the current.

2. *Fibro-Mucous Polypi.*

Fibro-mucous polypi rare

Fibro-mucous polypi of the naso-pharynx must be even more rare than the preceding, judging from the fact that few authors have taken any note of their existence. Nevertheless, Sir Morell Mackenzie has observed nine or ten cases, of which, unfortunately, he gives no particulars.[1] According to him, four other cases have been collected by Mathieu,[2] while careful examination of two others by Cornil and Coyne proved them to have the characters about to be described.

These growths appear to occur, in the first place, in the naso-pharynx, from which they may send prolongations into the nasal fossæ. Panas[1] has shown that the portion in the former situation consists of fibrous tissue, while that in the nose is composed mainly of mucous elements. This observer met with two cases, and gave an elaborate account of their microscopical characters. According to him, the portion in the pharynx was found by the finger to be densely resistant, while an examination through the anterior nares revealed small reddish growths. For a fuller account the reader is referred to Mackenzie's remarks.

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[1] *Diseases of the Throat and Nose*, vol. ii. p. 532.

[2] *Sur les Polypes muqueux des Arrière-narines*, 1875.

Diagnosis

The diagnosis is easily made from fibromata in their later stages, in that the growths under discussion do not tend to destroy or distort the neighbouring bones and cavities, and have no disposition to hæmorrhage. Where we have a dense tumour in the naso-pharyngeal cavity, with softer mucoid prolongations into the nasal fossæ, the diagnosis would present no difficulties.

Prognosis

The prognosis is in every way favourable, seeing that after removal these growths indicate very little tendency to recurrence.

Treatment

The treatment consists in removal in the manner promising the greatest facility. In most cases the snare, passed through the nose, would be the most satisfactory instrument; or the tumour might be removed through the pharynx with forceps.

3. *Enchondromata.*

Enchondroma

Besides these benign growths, cases have been recorded of enchondroma of the naso-pharynx. These have effected as extensive distortions as the fibromata, although the subjective symptoms in one recorded case have been remarkable by their absence. Epistaxis would presumably be absent, which is the only point serving to distinguish these from fibrous growths.

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[1] *Bull. de la Soc. de Chir.*, 1873, quoted by Sir Morell Mackenzie.

4. *Malignant Tumours.*

Malignant tumours of the naso-pharynx are extremely rare. The only recorded cases have been sarcomata. The symptoms they produce are not materially different from those of fibromata, though pain would appear to be an earlier symptom, being especially often referred to the ear; while the recurrence after removal is more rapid. The only real point of distinction is afforded by tactile examination, when the softer, more elastic impression given by the sarcoma is quite distinct from the dense hardness of the fibroma. On examination with the post-rhinal mirror, the growth may appear distinctly œdematous, as in a case now under my care, and seen in consultation with Mr. Charters Symonds. Here the distinction was made from simple mucous or fibro-mucous polypus by the profuse hæmorrhage after digital exploration of the post-nasal space. That portion projecting into the nose was even more like an ordinary polypus, though here also the least touch with a probe would cause violent hæmorrhage. The growth was examined by my colleague, Dr. R. Norris Wolfenden, who agreed with me in considering it a round-celled sarcoma. There was no enlargement of glands, except for a few weeks after a galvano-caustic operation, the bulk of the growth having been removed with the snare in the manner advocated for fibromata of this region. The patient in this case had been almost absolutely deaf in both ears and blind in the left eye,

Sarcoma

Diagnosis

although nothing but anæmia of the disc could be detected. After the operation he recovered his hearing and eyesight completely. But the case is too recent to report as to the results of treatment. Other cases on record have been mostly of a spindle-celled structure, mixed with varying quantities of fibrous tissue.

There is little or nothing to be said as to treatment beyond what has already been placed before the reader. The prognosis is bad, though in my own case there has been but slight tendency to recurrence since removal, and subsequent cauterising of the growth, four months ago. Mr. Clutton has reported a case of sarcoma of the naso-pharynx in a boy of fourteen years, which at first appeared to be a soft fibroma. It involved the basilar process of the occipital bone and the sphenoidal sinuses. The vomer was broken away with Loewenberg's forceps, the growth having been previously removed with a snare, and the neoplasm was scraped away with sharp spoons. Two operations were required; but no recurrence had taken place two years after the second.[1]

Clutton's case

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[1] *Lancet*, 1st December 1888. See also "Malignant Tumours of the Nasal Fossæ," by David Newman, M.D., *Annals of Surgery*, July 1891.

CHAPTER XIV

DYSCRASIÆ, ETC., AFFECTING THE NOSE

1. Syphilis. 2. Tuberculosis. 3. Lupus. 4. Rhinoscleroma.

1. *Syphilis of the Nose.*

Primary syphilis

Two instances of primary syphilis of the nose have been recorded in the last few years. The first was related by Spencer Watson,[1] the case being that of a nurse who had received the infection from a syphilitic infant. There was so much swelling of the nose, with elevation of temperature, etc., that a view of the chancre could not be obtained. It was followed in due course by the usual secondaries. More lately, Moure, of Bordeaux,[2] has published a case *in extenso,* where the chancre was situated on the right side of the septum, almost completely filling the vestibule, and pushing the ala outwards. The submaxillary glands of the right side were intensely swollen, while corroborative evidence existed in the pharynx and on the skin.

Secondary

In secondary syphilis it is exceedingly rare to find any diagnostic signs of the disease in the nose, though it is asserted that occasionally mucous patches may be found on the septum, on the inferior turbinated body at its anterior extremity, or on the inner aspects of the alæ. More often, when there is a large development of mucous patches in the pharynx, they may extend for a certain distance into the post-nasal space. But whether mucous patches be present or not, a catarrhal condition of the Schneiderian is very frequently encountered within the first few months after infection. Sometimes this is accompanied by considerable swelling of the mucous membrane, especially, so far as my observations go, in the region of the middle turbinated. This, indeed, may assume a distinctly congested, œdematous appearance, which subsides as the concomitant symptoms disappear under mercury. I have never observed any special discoloration of the mucous membrane, nor any tendency to a patchy appearance, such as is seen in the pharynx during secondary syphilis.

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[1] *Med. Times and Gaz.*, 1881, vol. i. p. 428.

[2] *Rev. Mens. de Laryngologie*, July 1887.

Mucous patches rare in nose

Tertiary disease of the nasal mucous membrane sometimes occurs very early. Cases are on record where necrosis of the nasal bones has occurred as early as the seventh month after the primary infection.[1] Usually, however, the tertiary symptoms do not appear until two to five years after. It is rare for the ulcerations to present the form seen so often in the pharynx, which results from breaking down of a gumma. But I have met with this on two occasions. In the first case, there was observed on the anterior third of the free border of the middle turbinated body a sharply cut, round ulceration the size of a large pea; the floor was yellow, and the areola was wide and angry-looking. There was no bare bone at the bottom. It healed rapidly under large doses of iodide. The other case

Tertiary

Ulceration

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[1] *Diseases of the Throat and Nose*, vol. ii. p. 397.

presented a deep, irregular ulceration of the septum, the surrounding mucous membrane being intensely inflamed and swollen. The history in this case was of five years' duration, and the symptoms yielded to iodide. **Usually slow** Usually the ulceration spreads more slowly, leaving large areas of suppurating surface or plates of necrosing bone. **Sometimes begins externally** Sometimes it begins externally by the formation of a tuberculous nodule on one or the other ala, which, becoming hardened and copper-coloured, and after persisting for a variable interval, breaks down into a slowly or rapidly extending ulceration, gradually destroying cartilage and bone. **Fœtor of dead bone** Then arises the horrible fœtor which is so characteristic of the disease, and always indicates the presence of necrosed bone. The sense of smell is rapidly destroyed, the palate becomes ulcerated, and the voice nasal, either from the pain experienced in moving the palate or from its perforation. **Deformity of nose** The nose falls in from one of two reasons—(1) from actual destruction of the cartilages of the alæ, or the nasal bones themselves, by the process of ulceration; or (2) by the destruction, complete or partial, of the osseous septum, whereby the support of the bridge of the nose is withdrawn. The bulk of the triangular cartilage may be destroyed without the slightest deformity resulting, provided its anterior margins be intact; whereas the necrosis of a very small portion of the bony portion may be sufficient to cause some flattening of the nose. **Absorption of bone, etc., without necrosis** According to Schech, whose observations are corroborated by Sänger and Schuster, primary perichondritis and periostitis of the septum, leading to absorption of cartilage and bone without any fœtid discharge or separation of sequestra, may lead to a falling-in of the bridge of the nose.[1] In tertiary syphilis of the nose there may be a purulent secretion without any perceptible odour of decomposition, provided there is not, at the same time, a portion of exfoliated bone lying somewhere in the cavities. Indeed, wherever we find the characteristic stench, we may be certain of the presence of necrosed bone.

Pus without fœtor

Rhinoscopy

On examining the interior of the nose there may be little to assist one to distinguish this from other forms of ulceration, especially if it has not led to the exfoliation of any portion of bone. In the latter case the stench is sufficient for the diagnosis. The ulceration is usually unilateral and the mucous membrane considerably congested, both of which points differ from the condition found in tuberculous disease. But, as in the latter cases, there may be considerable proliferation of granulation-tissue.

We may find sharply-defined ulcerated patches on the cartilaginous or osseous septum, and in the latter case we may find necrosed bone lying at the bottom of the ulceration, either loose or firmly attached. The whole of the turbinated bodies, middle and inferior, I have observed, may undergo molecular absorption without any exfoliation; in which case the resulting condition, as well as the stench from the dried and putrefying secretion, may exactly resemble a case of advanced atrophic rhinitis (see Case 42). From the latter the only means of distinguishing the case may be a perforation of the septum, which, in simple ozæna, is rare, is confined to the cartilage, and is never very extensive; or by the presence of cicatrices in the pharynx.

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[1] *Diseases of the Mouth, Throat, and Nose*, translated by R. H. Blaikie, 1886, p. 248.

Usually unilateral

Tertiary disease of the nose is usually unilateral. Gummata of the nose are not common, and generally affect the septum, on one or both sides. They are reddish, sometimes purplish, though occasionally paler, soft and pitting under the probe, though only to a slight extent. They are often accompanied by a purulent discharge, and sometimes give rise to neuralgic pains. Occasionally fungating granulations are mistaken for gummata, and the surgeon is surprised that they do not respond to iodide. The surrounding ulceration and microscopical proof that the excrescence is uncovered by mucous membrane will forestall error in this direction.

Gummata

Fungating granulations

Dr. J. N. Mackenzie, of Baltimore, has lately drawn attention to a form of syphilis which many must have encountered, although sufficient attention has not hitherto been directed to the subject. He calls it "syphilitic fibroid degeneration of the nasal passages."[1] It appears to occur especially in cases where a similar change has taken place in the laryngeal mucous membrane, to which special attention was drawn by Dr. Whistler. According to the former author, the nasal changes are met with, for the most part, in long-neglected cases, chiefly in men, and especially in those addicted to alcoholic intemperance. While it is the septum which mostly suffers from necrosis, etc., these cases affect by preference the turbinated bodies. They are "very much enlarged, and present the appearance of dense, hard, whitish-yellow or red, sessile masses, or are converted into distinctly pedunculated growths, which not only resemble, but are, in actual fact, true fibroid polypi of this region. . . . They are sometimes attacked by ulceration, and

Fibroid degeneration

Fibrous tumours

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[1] *Journ. of Laryng. and Rhin.*, April 1889.

in this way partially destroyed; or they may be bound, as the result of the ulcerative process, to opposing structures by dense bands of cicatricial tissue." It further appears that the normal structure of the turbinateds is more or less entirely replaced by the fibrous tissue, and that the tumours are destitute of epithelial covering. They are altogether insusceptible of improvement under anti-syphilitic treatment, in this respect differing from gummatous infiltrations, for which, when in a state of ulceration, they might possibly be mistaken. Than these they are harder, giving to the probe none of the elastic, pitting sensation communicated by the gumma. With the fibrous growths, moreover, the surrounding surface is anæmic to a conspicuous degree.

Chronic rhinitis

Apart from such gross changes as those just described, a simple chronic rhinitis, with vascular turgescence of the erectile tissue or with true hypertrophy, indistinguishable in its objective features from an ordinary catarrhal rhinitis, is not infrequently encountered as the result of syphilitic contamination. This must be borne in mind, although nothing but the history is of any value in the diagnosis.

Larynx

The condition of the nose, it must not be forgotten, is largely responsible for that of the larynx; and a dry atrophied condition of the intra-nasal structures, such as is frequently left after all active disease has been arrested, may be responsible for a laryngo-tracheitis, etc. (see Case 42).

Diagnosis

The diagnosis will be considered under the headings of Tuberculosis and Lupus.

Prognosis

The prognosis of syphilis of the nose is always a matter for the gravest consideration. Where there is exfoliation of the osseous septum little opinion should be expressed as to the termination, and the patient should be warned as to the possibilities. Where there is ulceration of the bone, which has not yet led to extensive necrosis, much good may be anticipated from constitutional treatment. In cases where, from the presence of the characteristic odour, it is certain that there is exfoliated bone, but which we are unable to detect in the middle or inferior meatus, and where the discharge, moreover, is flowing from the ethmoidal cells, the gravest fears must be entertained as to the patient's recovery; for a large portion or even the whole of the ethmoid bone may be necrosed. This, from its position, can hardly be removed by natural processes; while any attempts at surgical interference might be attended with fatal consequences.

Treatment

There is little to be said in regard to treatment beyond what is familiar to every medical man. But, besides constitutional treatment, great assistance may be obtained by judicious local applications. In the first place, it is essential that the nose should be kept as clean as possible by frequent washings with antiseptic and deodorant sprays and douches. All ulcerated surfaces must be treated on general principles. Fungating granulations must be scraped or cauterised, and the ulcers well dressed with iodoform or iodol powder. Necrosed and separated bone may be removed with impunity from the lower or middle passages: this should always be effected, although it may be necessary to break up the sequestrum with bone-forceps. But where the dead mass lies in the superior meatus, the greatest caution must be exercised, seeing that it is impossible to estimate the extent and relations of the piece. Trouseaux and Rouge have reported fatalities from the interference with such

Cleansing

Granulations

Dead bone

Calomel fumigation

masses. Where the ulcerated surfaces are extensive or extending rapidly, much may be gained from local fumigation with calomel. This is easily applied with an instrument constructed for the purpose (Fig. 66).

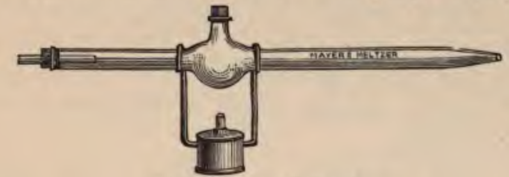

Fig. 66.—Calomel fumigator.

The tube for the calomel is constructed of porcelain, and beneath it is suspended a spirit-lamp. As soon as the vapour is liberated it may be driven into the nose by blowing into the other end, either with the mouth or with a hand-ball.

Hereditary syphilis

It is scarcely necessary, in this place, to give more than a passing reference to syphilis of the nose as it occurs as the result of hereditary infection. In the earlier stages it is impossible to distinguish the syphilitic catarrh of infants from that of simple rhinitis, especially if there be no other local or constitutional signs. The persistence of a muco-purulent catarrh, especially if it develop into a purulent secretion, is sufficient to justify a suspicion of syphilis; while, if the discharge become purulent and fœtid at an early age, the probability of the constitutional affection will appear great. If such a condition is neglected it may lead to the gravest consequences. The nasal bones or their supports may become destroyed by caries, and the nose may consequently collapse.

Hereditary syphilis is further stated to make its appearance as disease of the nose in children past infancy; and some authorities maintain that many cases of simple ozæna are due to the constitutional contamination. Nevertheless, the usual evidences of this in such cases are exceedingly rare, though I have seen two sisters suffering from ordinary atrophic rhinitis, whose mother was suffering from tertiary syphilis of the nose (Case 42). Further, a brother of these had lupus and destruction of the triangular cartilage, and a younger sister a troublesome muco-purulent rhinitis.

Early recognition important

The early recognition of syphilis of the nose in infants is of the greatest importance, not only for the sake of placing the patient under the correct general treatment, but also for the sake of the all-important local treatment. If ulceration is actually in progress, probably nothing will so readily check its progress as calomel fumigation, though, of course, the age of the patient must be carefully considered. It must also be remembered that mercury administered in this manner will produce salivation, etc., with a very much smaller dose than when given in any other manner. But of even more importance than this fumigation is the ensuring of perfect cleanliness in the nose. This is so difficult a matter that it can seldom be entrusted entirely to the mother or nurse. Into the constitutional treatment it is not necessary to enter in this place.

2. *Tuberculosis of the Nose.*

Tubercle

Tubercular disease of the nose is generally held to be exceedingly rare. Admittedly, it is but rarely observed as affecting the mucous membrane, though possibly future investigations may indicate that it is sometimes responsible for disease of the osseous structures. Considering the frequency of tuberculosis of the temporal bone, one may suppose the ethmoid, etc., to be liable in a similar manner. But, altogether, there are very few cases on record. Volkmann has expressed the belief that many cases of supposed hereditary syphilis are in reality tuberculosis; while, on the other hand, tuberculous cases are sometimes mistaken for lupus, and even malignant disease. Mackenzie states that he has never seen a single case. He asserts that it is always probably secondary to disease of the lungs, though many cases have been reported, from time to time, in which the nasal lesion preceded other evidence of the constitutional affection. In the only two cases observed by myself, both of which I have had under observation for over two years, there has never been any evidence of lung or laryngeal mischief. In one of these a large tumour, the size of a bantam's egg, was pronounced by Mr. Watson Cheyne to be tuberculous on microscopical grounds; yet there had been no recurrence two years afterwards, the patient being, in every respect, in the most perfect health (Case 44).

Its rarity

Two forms:

Tumours and ulcerations affecting septum

Tubercle of the nasal mucous membrane is generally described as occurring in the form of tumours growing from the cartilaginous septum, and varying in size from a small granulation to such a bulk as would completely fill the nasal fossa. The surface is smooth or irregularly granular, covered or not with epithelium, and varying in colour from a gray to a dark purple. The tumours bleed easily on examination with the probe, the inner portions being harder than the periphery. After removal they usually show a strong inclination to recurrence, while the site from which they have been removed indicates great reluctance to heal. Ulceration consequently results, and sometimes perforation of the septum. In my own case, above referred to, the tumour sprang from the margin of a perforation the size of a florin in the triangular cartilage, and completely occluded both fossæ, causing even some separation of the nasal bones.

Tuberculous ulceration of the mucous membrane sometimes appears far more intractable than the actual tumours, which are sometimes, as in the second of my own cases (Case 45), indistinguishable from large, fungating granulations, and may completely fill the nasal fossa of one or both sides, and even distend the nasal bones. The ulceration is generally accompanied by a purulent, sometimes fœtid discharge. In my second case, while the luxuriant granulations filled the left fossa, the septum on the right was covered, for the greater part of its extent, by the typical, superficial, ill-defined ulceration which is so characteristic of tuberculous disease in the fauces and larynx. Another point in common with the latter was the extreme pallor of the mucous membrane. Cases are recorded where the ulceration had partly destroyed the ala on one side. Tubercles Grayish-white tubercles are reported to have been found in the neighbourhood of the ulcers, while some cases are associated with similar ulcerations in the pharynx and larynx. Only exceptionally are the lesions found in other situations than the septum, though they sometimes extend far back on the latter. Progress slow The progress of the disease appears to be exceptionally slow as compared with the same affection in the pharynx or larynx, though in the first of my cases the tumour attained its full size in the space of three months.

Pathology

There is nothing, pathologically, to distinguish the products of tubercular disease of the pituitary mucous membrane from the same affection elsewhere. Suffice it to say that, in the granulations and tumours, giant cells may or may not be found, while the absence of bacilli is not necessarily an argument against the tuberculous nature of the growth.

Diagnosis

The diagnosis is sometimes exceedingly difficult, seeing that the factors are so little constant. In a case where tubercle is suspected, the condition of the lungs or larynx may afford great assistance; and where there is no such corroborative evidence, microscopical examination may prove of service. The chief diseases for which it might be mistaken are lupus and syphilis, seeing that in both of these we may have the co-existence of neoplasm and ulceration. In the former affection the granular appearance, both of the tumours and the floor of the ulcerations, the presence of cicatrices, and the age of the patient, may form a contrast to the similar features in tuberculosis; the superficial, ill-defined, worm-eaten, anæmic ulceration of the latter, when it exists, is quite peculiar. Moreover, it is stated that the temperature is never raised in lupus, whereas there is frequently some nocturnal exacerbation in tuberculosis. This, however, must be accepted with great reserve, as in a case of unequivocal lupus of the pharynx and larynx, sent to me by Dr. H. F. Lancaster, of Lewisham, we have both observed the temperature frequently elevated, and that although the patient is now completely recovered. The diagnosis between syphilis and tuberculosis may sometimes be very difficult; but the rapidity of advance and the more frequent implication of osseous structures in the former, with the microscopical examination in the latter, ought to preclude the possibility of error. Yet it must not be forgotten that, as lupus and syphilis may coexist, so may tubercle and syphilis.

From lupus

From syphilis

Prognosis

The prognosis is very unsatisfactory, so far as the ultimate recovery is concerned. For, though the tumours may be eradicated and the ulcerations persuaded to heal, yet there is a strong tendency for the cicatrices to break down again. This was strongly marked in my second case. Yet it must be borne in mind that the advance of the nose-affection is very slow, and that the patient will probably succumb to systematic infection before great destruction has taken place.

Treatment

The treatment consists in the eradication of the growths and granulations, either with the sharp spoon or with the electric cautery. In the first of my cases the whole mass of the tumour was removed with forceps, and the resulting perforation in the septum was freely cauterised with the incandescent wire. In my second, where the whole of the triangular cartilage was involved in the production of the obstructing masses, the clearance was effected by daily applications of chromic acid.

Destruction of granulations

This was followed by complete cicatrisation, although three months afterwards it had largely broken down again. The ulceration on the right side of the septum only reluctantly responded to any form of treatment. The first essential to healing, beyond the removal of granulations, is to keep the surface clean and free from incrustations of pus and mucus; for the removal of these, if only in the act of blowing the nose, tears up the tender epithelium, and retards whatever tendency there may be to cicatrisation. After careful cleansing and removal

Antiseptics

of crusts, the surfaces should be dusted with iodoform powder or painted with a fluid iodoform ointment (Form. XX.), and the nose finally plugged with cotton-wool to prevent the access of air, and thus the inspissation of the secretions. Beyond the conduction of the treatment on rational principles, it is highly questionable whether any of the new supposed specifics for tuberculous ulceration—such as lactic acid or menthol—are of any service; they have hitherto proved useless in my hands.

Biblio-graphy

In a subject concerning which so little positive information can be given, it may prove acceptable to the reader to have placed before him some references to the literature of the subject. The following are given by Sir Morell Mackenzie:—Lavaran, two cases, 1877, *Union Medicale,* Nos. 35 and 36; Riedel, also two cases, 1878, *Deutsche Zeitschrift für Chirurgie,* Bd. 10; Volkmann, 1879, *Sammlung klinischer Vortraege,* p. 31; Tornwaldt, 1880, *Deutsches Archiv für klin. Med.,* Bd. 27, p. 586; and Weichselbaum, 1881, *Allgemeine Wien. Med. Zeitung,* Nos. 27 and 28. Of more recent contributions must be mentioned those by Weichselbaum and Volkmann, *Centralblatt f. Chirurgie,* 1882, p. 26; that of Schaeffer and Nasse, eight cases, 1887, *Deutsch. Med. Woch.,* No. 15; of Bresgen, in the same journal and in the same year, No. 30; of Cartaz, 1887, *Union Medicale,* July; of Luc, 1889, *Archives de Laryng.,* February; and lastly, that of Juffinger, 1889, *Wien. klin. Woch.,* No. 13.

3. *Lupus Vulgaris of the Nose.*

Lupus may attack mucous membrane without integuments

The large majority of cases of lupus, involving the nasal cavities, is seen as the extension of the disease from the neighbouring integument. In such cases the diagnosis and treatment of the affection depend upon that of the cutaneous affection. In a certain number of cases, however, and probably more frequently than is realised, the disease may attack the mucous membrane of the nose, without either the present or former existence of any lesion of the skin in the immediate vicinity or elsewhere. Such cases are sometimes by no means easy of diagnosis, unless the mischief has extended to the pharynx or larynx, where the diagnosis is comparatively simple. The great difficulty in the nose appears to result from the fact that the whole field is foreshortened; we can see the ulcerations only edgeways, while the presence of inspissated crusts of secretion further disguises the appearance of the mucous membrane. Remembering, however, the characteristic points of the lupus-lesion, together with a few pathological facts peculiar to the nose, we shall generally be able to make a diagnosis in the course of time.

Affects septum

Lupus vulgaris, as it attacks the mucous membrane of the nose, is always seen first on the anterior part of the septum. It appears, in the first place, as an infiltration of round, well-defined, flat, discrete tubercles, causing a general tumefaction. They may be paler than the normal colour, though they sometimes present a brownish tinge. But, whereas on the skin they are on a level with or slightly depressed below the surrounding surface, on the septum they usually appear slightly raised. Indeed, at first sight it is not altogether easy to determine whether they are wide, flat, dry granulations, or whether they are tubercles covered with epithelium. Their surface may further be traversed by a few tortuous vessels. Altogether, the tubercles of the mucous membrane are much less defined than those of the skin, while their existence is doubtless often disguised by the intense congestion of the structure in which they lie. Nor in the nose are they so often observed in the form of minute, rounded prominences, closely packed together over large areas, such being the usual appearance in lupus of the pharynx and larynx. Ultimately, on the septum, as

Special features of tubercles

elsewhere in mucous membranes, they coalesce, forming extensive raised patches with an uneven surface. The superficial epithelium becomes greatly thickened; and, mixed with mucus drying on the surface, it peels off in scales which may remain partly attached, sometimes overlapping one another in greenish-yellow scales. Deep ulcerations, sometimes fissure-like, may form in the midst of the infiltration, or the whole surface may break down into ulcers with a red, granular floor. Lastly, the tubercles may slowly shrink and disappear, leaving depressed shining cicatrices. The lupus-process may further extend deeply into the subjacent structures, leading to great destruction of the cartilages and distortion, from the contraction of the resulting cicatrices. According to Kaposi, necrosis of bone does not occur in the nose; while, destruction of the osseous septum seldom being observed, there is not the same liability to falling-in of the bridge. This, however, has been strongly denied by other authorities; and a case was recently reported where the nasal bones were necrosed, there being no history or evidences of hereditary syphilis.[1]

Ulcerations and fissures

Destruction of cartilages

As the disease advances it extends over the floor of the nose and ascends the outer wall. In this manner the turbinated bodies may be destroyed, and the cartilages of the alæ may be absorbed from the inside before any sign of the mischief has made its appearance externally. Sometimes fungating granulations may almost completely fill the fossæ, and prevent an accurate examination of the interior until they have been removed. Around the alæ pustules may be seen involving the follicles of the vibrissæ.

Turbinated bodies involved

Interior of alæ

As a rule, as has already been remarked, lupus of

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[1] Lupus of the Throat and Nose, by Dr. J. M. Hunt, *Journ. of Laryngology and Rhinology*, September 1889.

When affecting integument

the mucous membrane of the nose is usually associated with cutaneous disease at the same time. The ordinary external appearances are, according to Kaposi, "bluish-red and white, glistening, cicatricial spots and streaks; flat and prominent, isolated and confluent, tubercles and nodes and infiltrations, with a smooth surface or desquamating, are mixed together without any regular arrangement."[1] Ultimately the nose, although it may have appeared enormously enlarged from the granulations and thick crusts, grows shrivelled and uneven at its edges; it becomes pale and rigid.

Diagnosis

Practically, the only disease which might be mistaken for lupus vulgaris is syphilis. To quote Kaposi once more: "The loss of tissue which results, and the formation of ulcerating outgrowths and ulcers, are common to both. The ulcerations in lupus, after the removal of the crusts covering them, have a different appearance to that met with in syphilis. Their borders are occasionally sharply defined, and they are rounded in shape, though they are also frequently irregular. They are not so deep as the ulcers in syphilis, being quite flat, or only slightly deeper towards the centre; their margin is less infiltrated, less painful, their base is softer, and not covered over with a fatty-looking substance, but, after it has been cleansed, appears of a bright red colour, bleeds easily, is occasionally fissured, and of unequal depth."[2] With regard to the tubercular formations in the two affections, it may be stated that in syphilis they are larger, harder, less vascular, as a rule copper-coloured, and not desquamating. But the great point in distinction is the rapidity of progress. The degree of mischief that will be effected in a few

From syphilis

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[1] *On Diseases of the Skin*, by Hebra and Kaposi, New Syd. Soc., 1875, vol. iv. p. 59 *et seq.*

[2] *Ibid.*, p. 88.

weeks with syphilis may take years for lupus to develop.

Prognosis The prognosis differs in no material respect from that of lupus vulgaris as observed in other parts of the body, though in the case of the nose the question of deformity is the most serious consideration. Upon this point an opinion can be expressed only after the most careful cleansing and examination of the diseased structures have been made. If the external parts are affected, and the nose much enlarged from the formation of luxurious granulations and thick crusts, a probe may possibly reveal the fact that the cartilages are more or less destroyed, and that the most obvious consequence of treatment will be to reduce the size and cause apparent shrinking of the member. Such a point as this must be well borne in mind. Further, no opinion can well be expressed until the treatment has been conducted for a time on a scientific basis. It must further be remembered that lupus may disappear spontaneously, to break out afresh or not as the case may be.

Treatment The treatment of lupus is one of the most difficult questions with which the surgeon has to deal, and demands considerable experience for its successful and safe conduct. Care is especially required in the prevention of scarring and unsightly cicatrices, both externally and within the fossæ. Destructive processes must be scrupulously limited to diseased regions. Of destructive agents the two most approved are the electric cautery, which was introduced for this purpose by Hebra, and the method of scraping or scarifying, as advocated by Volkmann in terms of the utmost confidence. His method of puncturing and scarifying has proved useful in my hands. But upon the respective merits of the various methods of effecting the destruction of the lupus tissue it is not proposed to enter, seeing that such are amply detailed in the text-books on skin diseases. No improvements in the treatment of the disease as it affects the nose have been offered by specialists. It must not be forgotten that cod-liver oil and tonics exercise the most decided action upon the progress of the disease.

4. *Rhinoscleroma.*

As an affection involving both skin and mucous membrane of the nose may be described in this place the rare disease, designated by Hebra, *Rhinoscleroma,* in the year 1870.[1] In Europe it is almost confined to the eastern parts of Austria and Russia. It is also observed in Central America. Very seldom has a case come under observation in this country, though now and again an erroneous diagnosis is made. Cases are from time to time described which obviously differ widely from the malady under discussion. In the words of Kaposi, "Rhinoscleroma appears in the form of flat or rather elevated, sharply defined, isolated or conglomerate tubercles, rounded prominences or plate-shaped structures of extraordinary density, which attack the skin or mucous membrane of the alæ or septum nasi, and the adjacent portions of the lip."[2] The tubercles either present the colour of the adjacent skin, or are of a uniformly bright or brownish red hue. They are shiny on the surface, are devoid of hair, and are traversed by dilated blood-vessels. There may be cracks or deep fissures at the

Symptoms of rhinoscleroma

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[1] Rhinosclerom, *Wien. Med. Woch.*, 1870, No. 1.

[2] *Diseases of the Skin*, by Hebra and Kaposi, New Syd. Soc., 1875, vol. iv. p. 2 *et seq.*

attachments of the alæ which discharge a scab-forming exudation. The patches are said to be sometimes of almost an ivory hardness, while some pain is experienced on handling them. They are usually developed more or less symmetrically on both sides. After some years' duration the growth has increased to such an extent that the alæ become distended and occluded, while the tip of the nose appears broad and depressed. As the consequence of the infiltration the nose grows perfectly rigid. Gradually the lip also assumes a similar condition until its mucous surface is involved and the disease spreads to the alveolar border. There is no tendency to any modification of the new growth, and it is capable of indefinite extension. Ultimately, as the disease extends backwards, the palate becomes fused with the posterior wall, the larynx becomes infiltrated, and tracheotomy may be necessitated from stenosis of the windpipe. In rare cases the tongue, ears, and eyes are affected. When the disease has reached the mouth and pharynx great pain may be spontaneously induced. Ulceration is only very exceptionally observed in the pharynx, and then sometimes shows a ready disposition to cicatrise.

Rigidity of nose

Larynx and trachea

Microscopically, the growth appears to be allied to the round-celled sarcoma, though, according to Cornil,[1] there are certain small highly refracting, hyaline bodies which form the characteristic element of the growth. Recent researches of Frisch show that certain microbes are the initial factor in the production of the disease, while Stepanow has inoculated portions of the neoplasm and cultures of the micro-organisms into animals with positive results in every case, proving

Pathology

Bacilli

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[1] *Progrès Médical*, 1883, p. 587.

rhinoscleroma to be an infective disease.[1] Kaposi states that the cells of the new formation do not present the dim, finely granular, indistinctly nucleated appearance met with in lupus and syphilis.

Diagnosis Diagnosis has to be made from syphilis, keloid, and epithelioma. Every syphilitic nodule undergoes sooner or later metamorphosis in its central parts, and, in the course of a few weeks or months, either suppurates or undergoes absorption. This is in strong contrast to the most striking feature of rhinoscleroma. Moreover, in the latter constitutional treatment is quite inoperative. Kaposi admits that the distinction on clinical aspects between keloid and rhinoscleroma is almost impossible, except in those cases where the latter disease has the appearance of a hard disk situated beneath the skin. "It must be almost impossible to diagnose a prominent tuberous rhinoscleroma with a glistening surface traversed by congested dilated vessels from keloid, which it also resembles in the stability of its tissue."[2] Microscopical examination alone could prove of any assistance; for keloid consists wholly of fibrous tissue, showing no signs of the cellular infiltration, already mentioned, of rhinoscleroma. Epithelioma can only be mistaken before the ulceration has set in. But before this event the glistening and transparent appearance of the margins with the vesicular-looking nodules should prevent error.

Treatment The only treatment of any avail is excision.

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[1] *Monatsschr. für Ohrenheilk.*, 1889, No. 1.

[2] *Loc. cit.*, p. 11.

CHAPTER XV

CONCLUSION

1. Epistaxis. 2. Post-nasal Catarrh. 3. Anosmia and Parosmia. 4. Foreign Bodies in the Nose. 5. Rhinoliths and Nasal Calculi. 6. Insects in the Nose. 7. Collapse of the Alæ. 8. Congenital Malformations of the Nasal Fossæ.

THERE remain only a few points to discuss before closing the treatise. Some of these are but symptoms of different diseases, which, from want of precise knowledge, are usually discussed as though they were diseases in themselves. Others are rare or obscure affections about which our knowledge is not precise enough to permit of lengthy discussion. Among the former are epistaxis, post-nasal catarrh, and certain disorders of olfaction; and among the latter will be discussed foreign bodies in the nose, rhinoliths and calculi, and insects in the nose. Besides these, a few words must be said about collapse of the alæ, and congenital malformations of the nasal fossæ.

1. *Epistaxis.*

Epistaxis

Epistaxis never constitutes an affection *sui generis*, but is dependent either upon some constitutional or remote disease, or some abnormal condition of the pituitary membrane. Among the former we find it occurring in chronic Bright's disease and affections of the spleen. In some of the exanthemata it is an occasional symptom, especially in smallpox, typhus, and relapsing fever. It is also met with in certain conditions of the blood, such as anæmia or plethora, scurvy and purpura, leucocythæmia, etc. In all of such it may alternate with hæmorrhage from other organs. In acute yellow atrophy of the liver and phosphorus-poisoning bleeding from the nose is not uncommon, while it must not be forgotten that many cases are due to the hæmorrhagic diathesis.

Ætiology

Constitutional causes

Increased pressure

Many sources of intensified pressure within the vessels, or actual disease of the walls of the vessels, may lead to epistaxis. Thus in atheroma, syphilis, and alcoholism; when there is pressure on the jugular veins, *e.g.* in goitres and other tumours of the neck; in venous obstruction from the various sources of over-filling of the right side of the heart; after violent exercise or excessive mental excitement; in such conditions epistaxis may form a prominent symptom. Lastly, it may occur vicariously for the menstrual function.

Local conditions

Of local conditions the most fruitful source of epistaxis is undoubtedly rhinitis sicca in full-blooded individuals. In these subjects the affection, as has previously been detailed, is chiefly confined to the septum, which, from the frequent and forcible removal of the inspissated crusts of mucus, is remarkably prone to ulceration, and hence to hæmorrhage. Other local conditions leading to hæmorrhage from the nose are the various forms of ulceration, fibrous tumours of the naso-pharynx, malignant disease of the nose, and rarely exostoses. In polypus and other hypertrophies it is exceptional, while even in vascular turgescence of the erectile tissue it is by no means more common than in other affections. It must be remembered that simple nose-bleeding sometimes leads to an acute *ostitis media*, in consequence of the blood entering the Eustachian tube.

In any case, the septum is the most frequent site of the rupture of the blood-vessels in epistaxis. Next to it we most often find the bleeding points on the inferior turbinated body. It is, moreover, usually the anterior parts of the nose that bleed; and, for the most part, the hæmorrhagic areas are within easy reach. It is only when the bleeding is very profuse that we have difficulty in detecting the exact origin. It must, moreover, be remembered that the blood may pass from one nasal fossa to the other, either round, or through a perforation in, the septum. Occasionally the only symptom is pæmatemesis or melæna. Objective examination with a speculum and a good light should never be omitted in any case of severe epistaxis; for by this means the bleeding points may be touched with some chemical caustic or the incandescent wire; while, failing these, the nose may be plugged with the minimum amount of discomfort to the patient.

Objective examination essential

Treatment

In treating a case of epistaxis, it must not be forgotten that in plethoric individuals it should not be too hurriedly interfered with, since it may be in these patients a natural means of relief to the system. In all cases where the medical aspects of a case render the loss of blood desirable, due judgment must be exercised before arresting the flow. When prolonged, one or other of the domestic remedies generally suffices. Lying supine, or standing with the arms raised above the head, cold sponging to the nose and forehead, or cold insufflations of water are generally, one or the other, efficacious. Failing these, water at a temperature of 110° F. may be injected or insufflated into the nose with the best results. Before applying astringents, which, to be of any use, necessarily irritate the mucous surfaces to a serious extent, the interior of the nose should be carefully explored, and any bleeding points cauterised, or their neighbourhood carefully plugged. Styptics Of styptics I have found very finely ground matico leaves (Form. XIV.) more useful than other astringents. It can be applied with an insufflator with a minimum amount of discomfort to the patient. Dr. Stockman has shown that gallic acid is useless except in so far as it acts like any other weak acid, while tannic acid is only of service in that it precipitates albumen.[1] Perchloride of iron is far too irritating for use in the nose. Plugging Failing such measures, the nose must be plugged according to the methods usually advocated. Anterior plugging is best employed with long strips of lint, which should be thrust as far as possible into the anterior nares until the cavity is quite filled. To plug the posterior nares, a piece of stout silk is passed through the anterior nares into the pharynx and withdrawn through the mouth. This is effected with a Bellocq's cannula (Fig. 67), or with an ordinary flexible catheter. To the silk is then attached a firm roll of lint, about the size of the ungual phalanx of the patient's thumb, in such a manner that a long end of the thread is left hanging. The plug is then drawn into the naso-pharynx with the help of the finger; and, as soon as it is firmly fixed, the two ends of the silk are tied together over the lip, a fold of lint intervening. This should be firmly fixed with plaster to obviate all risk of the plug slipping back into the pharynx. The plug should not be left longer than twenty-four hours in the cavity, for fear of producing ulceration and septic trouble.

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[1] *Brit. Med. Journ.*, December 1886.

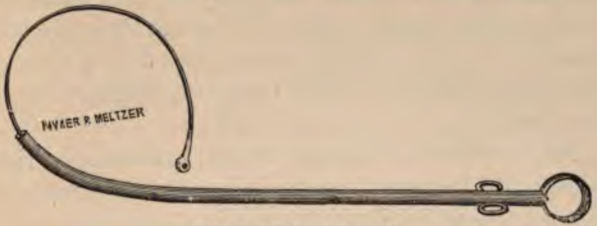

FIG. 67.—Bellocq's cannula.

2. *Post-Nasal Catarrh.*

Post-nasal catarrh usually a symptom

Post-nasal catarrh is usually described as a disease of the region from which it takes its designation; whereas it will be gathered, after a perusal of the preceding portions of the volume, that discharge of mucus, muco-pus, or pus into the pharynx from the regions above is but a symptom of many diseases, the fluid productions of which flow backwards rather than from the anterior nares. Thus posterior enlargements of the inferior turbinateds, polypi of the hinder parts of the nasal fossæ, post-nasal growths, inflammation of the posterior ethmoidal cells, or of the sphenoidal sinus, middle-ear catarrh, not to mention the various less frequently encountered neoplasms of the post-nasal space; any and all of these may give rise to a discharge into the pharynx. Moreover, other affections, such as dry rhinitis, collapse of the inferior turbinated body, or atrophy of the intra-nasal structures from one cause or another, which induce a partial inspissation of mucus on the posterior wall of the nasopharynx, may, from the inability of the thickened mucus to flow away, induce its accumulation in the post-nasal space, and thus produce the distressing symptoms ascribed to the supposed affection styled post-nasal catarrh.

Chronic post-rhinitis

Follicular disease

But, besides the diseases above enumerated, there are two affections confined to the post-nasal space, the most prominent subjective symptom of which is caused by the flow of mucus into the pharnyx. These are (1) a catarrhal condition of the upper portion of the posterior wall of the cavity; and (2) follicular disease of the post-nasal lymphoid tissue. The former, as a rule, is but part of a general chronic rhinitis, though sometimes it appears to be confined to the region in question, while the latter is an affection of the lymphoid tissue similar to that involving the tonsils, the posterior wall of the pharnyx, or the lymphoid tissue on the base of the tongue.

But against the above views as to the ætiology of the symptoms called post-nasal catarrh must be cited the opinion of that distinguished nose-specialist, Dr. Beverley Robinson of New York, who distinctly states that the affection, as he considers it, must not be confounded with ordinary rhinitis. On the contrary, he holds that post-nasal catarrh is the national disease of his country. But as it appears to me, it must be admitted that nose-affections in general are far more common in America than with us, else one can hardly understand the fruitful production of rhinologists all over the country.

Subjective symptoms

The subjective symptoms are sufficiently included in the title of the disease. The patient is troubled with a more or less continual inclination to hawk mucus from the throat, often preceded by a noisy inspiratory act through the nose, which forces the mucus into the pharynx proper. After the symptoms have persisted for a variable period, the voice becomes affected, either from the constant presence of some obstruction in the post-nasal space preventing the perfect approximation of the palate to the posterior wall, or because the velum becomes actually enfeebled in its movements. Hence the sufferer has a tendency to speak through his nose, in the manner of one suffering from paresis of the palate. Post-nasal catarrh is so extraordinarily prevalent in the United States that it has been styled American catarrh, although, for the reasons mentioned, there appears to be no very good reason for considering it a disease *sui generis.* But the frequency of chronic rhinitis having a special tendency to affect the posterior regions rather than the anterior, and men more frequently than women, in that country, may very likely account for the frequency with which the men, rather than the women, adopt a nasal intonation. This suggestion is offered with full appreciation of the error constantly made in supposing this form of speech to be characteristic of the nation. The American accent is more correctly described as partaking, more strikingly than the English, of the nasal *resonance* (not intonation), a point which accounts for the sharp incisiveness of their tones as distinguished from the *throaty* articulation of ourselves.

Nasal speech

American catarrh

American and English accent

In catarrh pure and simple of the post-nasal space, there is sometimes an enormous production of mucous or muco-purulent secretion. This is sometimes exceedingly tenacious, so that the patient experiences great

Secretion

difficulty in removing it. The effort at clearing it from the throat is sometimes so great as to induce attacks of vomiting, which, owing to the accumulations over night, may supervene every morning. After speaking, so great is the effort at sufficiently closing the post-nasal cavity that there may be much distress from aching referred to the pharynx and ears. Sometimes, from the adhesion of the crusts to the region of Luschka's tonsil, there may be some hæmorrhage. Occasionally the symptoms are associated with Eustachian catarrh and deafness.

Vocal trouble

Objective symptoms

Objectively, supposing the symptoms not to be due to the many forms of disease of the nose which might produce them, we perceive, after the mucus has been washed away with the post-nasal syringe, a granular appearance of the upper part of the posterior wall, which increases as the collection of lymphoid tissue is approached. Between the two halves of this, the central depression may be seen, which, together with the sac-like depression into which it sometimes leads, is considered of so much importance by Tornwaldt. To the affection, as described by this distinguished observer, reference has already been made. In Rosenmüller's fossa an accumulation of mucus is often seen, and here also there may be an appearance of increase of the lymphoid tissue. Running down from the Eustachian tubes on each side may sometimes be seen the band of dark red, smooth, or granular mucous membrane which, on its reaching the pharynx, is called by the Germans *pharyngitis hypertrophica lateralis*. In fact, one is constantly forced to the conclusion that, in these cases, there is no scientific distinction to be drawn between the various affections comprised under the term chronic pharyngitis and the appear-

Tornwaldt's disease, see p. 138

Pharyngitis

ances under discussion. Moreover, even as we find a granular affection over the whole or part of the posterior naso-pharyngeal wall, so may we have a follicular disease either in the pharynx or the post-nasal space. In the latter case we perceive the regions most affected by the lymphoid tissue, studded over with white points, from some of which the caseous contents may be seen projecting. In these cases the patient may occasionally bring into his mouth small pieces of this substance, which he describes as tasting or smelling offensively.

Diagnosis

There is no difficulty in diagnosis to any one familiar with the use of the post-rhinal mirror. It will be well to remember, however, that a secondary syphilitic catarrh associated or not with mucous patches in the pharynx, as well as tertiary ulcerations, may be responsible for the symptoms. In the latter case there will be usually some pain as well as the objective appearances to prevent error.

Prognosis

The prognosis is entirely dependent upon an accurate diagnosis. Where the catarrhal condition is confined to the post-nasal space, it is sometimes a matter of grave consideration whether a cure can be effected. Yet in all cases the symptoms can be alleviated by a constant application of remedies. In young patients there is seldom much difficulty in effecting a practical cure, though in cases of many years' standing there must always be some doubt.

Treatment

The treatment consists, in the first place, in enabling the patient to remove the quantity of mucus which is the main cause of his distress. This is best effected by one or other of the nose-washes found in the Appendix of Formulæ. Where there is a tendency to inspissation, chloride of sodium is of distinct advantage,

Astringents

Electric cautery

while, if the carbolic acid prove too irritating, it must be omitted. After cleansing has been satisfactorily accomplished, insufflations of catechu, matico, dried alum, or eucalyptus (Formæ. XIII. and XIV.) may be blown into the post-nasal space with a laryngeal insufflator. This is a matter that can seldom be entrusted to the patient, and its success can be ensured only by patient employment for many weeks or even months. Where there are granulations or hypertrophies, I have found much advantage from a cautious use of the electric cautery. This needs some dexterity in its application. It is especially difficult to use in cases where the patient cannot relax the soft palate sufficiently to enable the operator to obtain a view of the parts he is cauterising. To diminish the risk of accidentally burning the velum in withdrawing the heated point, or of injuring any of the anterior or lateral structures, I have designed an instrument by which the cauterising of the posterior wall may be conducted with perfect safety (Fig. 68). It consists of an ordinary Mackenzie's cautery-handle, to which

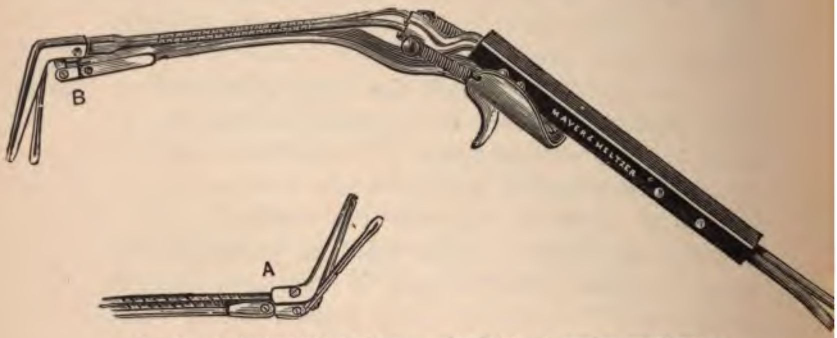

FIG. 68.—Author's shielded galvano-caustic point. A, for post-nasal space; B, for base of tongue.

Author's guarded cautery points

are attached the conducting wires, bound together in the usual manner, but bearing, at right angles to their extremity, an ivory shield, which encloses, laterally and posteriorly, the platinum point. This is hinged to the conducting rods, its terminations projecting below the hinge in such a manner that it can be protruded from its shield by a lever extending to the handle of the instrument. To this lever is attached a trigger which, at the same moment that it approximates the point to the posterior wall, renders it incandescent by pressing on the connecting button of the holder. The instrument is constructed with interchangeable conducting rods and termination, so that it can be applied for the purpose of cauterising the base of the tongue without injuring the epiglottis. Messrs. Mayer and Meltzer have most ingeniously carried out my idea in constructing the instrument. I have on many occasions employed it with great advantage. The only objection to the employment of the galvano-caustic in this region is the severe pain it generally produces in spite of the free use of cocaine, while every minim of the solution used in this situation inevitably passes into the throat and stomach. Consequently, to produce the desired effect, more cocaine must be used than is consistent with perfect safety; and it cannot be too strongly insisted that this very powerful drug should always be used with extreme caution. But even when the cauterising is conducted without much suffering, there is almost always serious headache complained of for twenty-four or forty-eight hours afterwards; and on two occasions I have been somewhat alarmed at the severity of the symptoms. Yet against this disadvantage must be insisted the fact that this means of treatment promises

Post-nasal region highly sensitive

Subsequent serious headache

to be the best we possess of diminishing the excessive secretion of mucus, provided the cases are properly selected.

Treatment of follicular disease

Where a follicular condition of the mucous membrane exists, it is best treated by scraping with a curette, curved in such a manner that it may be inserted behind the velum. This very painful proceeding should be effected under a general anæsthetic, otherwise several repetitions may be necessary.

Constitutional treatment

Little can be effected in these cases by constitutional treatment. Tonics and change of air are of course necessary in some cases. Many of the patients are distinctly of a neurotic temperament, and need treatment accordingly. Beverley Robinson strongly recommends cubebs, ammoniacum, and sulphur. The waters of Harrogate, Luchon, or other spas in the Pyrenees, may prove of service, while some patients may find advantage from a sojourn at Mont Dore. Health resorts, where much dust is floating in the atmosphere, such as the Western Riviera, should be avoided, as any such irritation is liable to aggravate greatly the symptoms.

3. *Anosmia and Parosmia.*

Anosmia

Ætiology

Anosmia also, in the large majority of cases, is but a symptom of various inflammatory affections of the nose. Thus in chronic rhinitis, whether hypertrophic or atrophic, it is by no means uncommon. With polypus the sense of smell is lost, either as the consequence of the inflammatory affection having extended to the olfactory mucous membrane, or because the access to the latter is hindered by mechanical causes. Unfortunately the former is the more frequent contingency. Some remarks have already been made on olfaction as a symptom of disease in Chapter II., and it now only remains to refer to certain states where the loss of smell assumes the aspect of a disease *per se.*

Rare in central nerve disease

In the uncinate gyrus, on the inner side of the temporo-sphenoidal lobe, Ferrier localises the joint-centre of smell and taste. But loss of smell does not appear to be at all common in aphasic patients, though, according to some authorities, it is more common in disease of the right brain than the left. Any source of disease of the fifth nerve may lead to abolition of the olfactory sense, owing to the malnutrition of the mucous membrane induced; while it is said that injury to the seventh (portio dura) also affects the sense. But, altogether, anosmia from central disease is not common.

Exciting causes

Apart from various gross diseases of the nose which result in a loss of smell mentioned above, it would appear that very little over-stimulation of the olfactory mucous membrane may suffice for the total abolition of the sense. Thus, in various injudicious attempts at arresting either an acute or chronic rhinitis by means of energetic remedies, the desired end may be gained at the expense of the sense of olfaction. Powerful smelling salts, insufflation of astringent powders or douches, chloride of ammonium, iodine, or other vapours, etc., may all, in certain cases, result in grave and perhaps permanent injury to the sensitive membrane. Cases are even recorded where powerful and disgusting odours have wrought similar mischief.

See p. 42

Loss of smell may be partial or complete. As has been mentioned in Chapter II., the disability may be confined to the anterior portions of the nose, in which cases patients not infrequently assert that they can taste an odour although they cannot smell it. Not infrequently the loss of smell without any obvious reason is associated with purely subjective sensations of smell. Such parosmiæ present innumerable forms and varieties. In some cases they are not altogether subjective. For instance, a patient, having lost his normal power of olfaction, will be haunted by a disgusting odour of a very persistent nature during and after exposure to any or all of the stronger stimulants of the olfactory sense. One odour cannot be distinguished from another, each giving rise to the one invariable impression of the unpleasant smell. Similar conditions in states of health are those commonly experienced where, for some hours after exposure to a disagreeable smell, everything tastes and smells like it. Perversion of the sense of smell is sometimes hysterical, associated or not with anosmia, and rarely depends upon central nerve-disease. Anomalies in olfaction are often very remarkable in their exemplification, while the manner in which the cure of such conditions is sometimes effected is no less inexplicable.

Parosmiæ

Prognosis

The prognosis of anosmia, from whatever cause arising, must always be very guarded, although few cases can be certainly pronounced hopeless. This especially applies to cases where obvious disease of the nose is responsible for the symptoms. The probability of recovering the sense is inversely proportionate to the duration of the disorder. In polypus or atrophic rhinitis of many years' duration there is not much hope of restoration (see Case 43).

Treatment

The treatment depends upon the cure of the affection producing the symptoms. Electricity has not proved of much service. Morphia, when applied to the olfactory mucous membrane, paralyses the function, while strychnia renders it more sensitive. Hence the latter may sometimes be of service in treating anosmia, while the former might prove serviceable in distressing parosmiæ. Mackenzie speaks highly of the insufflation of a powder containing the twenty-fourth part of a grain of strychnine with two grains of starch applied twice daily to the mucous surface.

4. *Foreign Bodies in the Nose.*

Foreign bodies in the nose

Foreign bodies are frequently inserted into the nose by children, especially in the form of berries, beads, hair-pins, dressing-pins, etc. Even older persons, mostly insane, sometimes insert such articles. Patients suffering from paralysis of the palate, or from cleft-palate, occasionally force hard substances into the post-nasal chambers during the acts of swallowing or vomiting. Various accidents may be responsible for the presence of foreign bodies in the nose or the accessory cavities. Bullets, bayonet points, etc., have found their way into the fossæ or antra. Dr. Cribb, of Highbury, tells me of a case where a probe was accidentally thrust into the antrum and remained there loose, so that the patient could make it rattle at will, for over twenty years. I have known a piece of Ellis's drainage-tube, inserted from the alveolar border into the antrum, disappear and ultimately reappear in the middle meatus.

Vegetable bodies

Vegetable substances swell often to a considerable extent, and beans, etc., sometimes actually germinate in the cavities. In this case pain and all the symptoms of an acute rhinitis may supervene, which, in subsiding, leaves a chronic and purulent, sometimes fœtid, discharge from the anterior nares.

Diagnosis The diagnosis depends, in most cases, entirely upon the history; but in the case of young children, where such is unascertainable, a rhinitis with pain and swelling of the nose, and later accompanied by a purulent fœtid discharge, would suggest the possibility of a foreign body. Careful examination of the interior of the nose under an anæsthetic may be necessary to the establishment of the diagnosis.

Treatment A foreign body can in almost every case be removed with little difficulty. Even when neglected, the danger consists only in the remote possibility of a rhinolith forming.

If the position of the body can be accurately ascertained, it can generally be easily removed with forceps or some form of spud. If it be very large from swelling, it may be desirable to push it backwards into the naso-pharynx; but this should be attempted only under an anæsthetic, so that the fingers may be inserted into the pharynx, and the substance thus prevented from falling into the larynx. Sometimes a stream of water injected through the free nostril, and allowed to return through the one obstructed, may effect dislodgment.

Mr. C. W. Dodd[1] recommends the removal of foreign bodies from the nose by forcible blowing through the free nostril, by means of india-rubber tubing applied to the mouth of the surgeon. At the same time the soft palate must be raised either by the child's crying or by his swallowing a mouthful of water.

5. *Rhinoliths and Nasal Calculi.*

Rhinoliths Considering the frequency with which foreign bodies are inserted into the nose, it is perhaps somewhat surprising that calculi are not more often encountered. In the majority of cases it would appear that the nucleus of the rhinolith consists of some foreign substance. Occasionally, however, there is no suggestion of such a mode of origin, and it is sometimes inferred that gouty deposit is the starting-point. The bulk of the formation undoubtedly consists of the salts precipitated from the mucus of the nose. The stone is usually single, though cases have been recorded where two or more were found in the one nasal fossa. The surface may be smooth or variously roughened, and the colour is usually blackish. Sometimes the stone is partly embedded in the mucous membrane. Ætiology

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[1] *Lancet*, November 1888.

The symptoms caused by rhinoliths are always of a chronic character, extending over many years, and slowly increasing in intensity. Sometimes there may be external swelling, and even fistulæ in various situations. A fœtid purulent discharge is an invariable symptom, while there may be various inconveniences from pressure, such as epiphora, empyema of the antrum, etc. In most cases the obstructing mass can be detected with the probe, though in cases where it is embedded in the mucous membrane this may be impossible. The rhinolith can usually be moved to a certain extent. Symptoms

Diagnosis The only condition for which it could be mistaken is that of a necrosed portion of bone, the result of syphilis. The shapes of such pieces of bone are sometimes so irregular that it is impossible to ascertain where they were attached. But careful examination of the portion when removed will generally establish the diagnosis.

Treatment The treatment consists in the removal of the stone with forceps. It may be necessary to fracture it, in the first place, either with bone-forceps or with a lithotrite. Occasionally it may be pushed back into the naso-pharynx with advantage.

6. *Insects in the Nose.*

Before leaving the subject of foreign bodies in the nose, a few words must be said on the rare event of insects either being hatched in this region or finding their way there subsequently. Very few such cases are on record. They are confined to the tropics. Mackenzie gives an elaborate and very perfect account of the history of the affection. It arises from the deposition within the nasal fossæ of the eggs of a fly resembling the common bluebottle, and their being hatched in the same locality. The symptoms produced are sometimes very severe. Sneezing, itching, muco-purulent and sanious discharge, and sometimes epistaxis are observed. Intense headache, œdema of the head and eyelids, ulceration of the mucous membrane, caries of the cartilages of the nose and bones occur in severe cases; while occasionally convulsions and death supervene. The maggots are sometimes extruded during blowing of the nose or sneezing, and sometimes they crawl out spontaneously. The disease has been described in India as *Peenash.* The prognosis is very grave if the disease is neglected. The treatment consists in the application of chloroform to the nose either in the form of vapour, or, after anæsthesia has been induced, by the injection of chloroform, either undiluted or mixed with an equal quantity of water.

Maggots

Peenash

Other entomozoa

Besides maggots, caterpillars, leeches, ascarides, centipedes, earwigs, etc., occasionally find their way into the nasal fossæ. Centipedes have been known to remain alive in the nose or one of its accessory cavities for many years, the symptoms being of the gravest nature. But such cases are so rare that it is sufficient to mention the fact of their possibility.

7. *Collapse of the Alæ.*

Collapse of the alæ

Collapse of the alæ is a rare cause of obstruction to the entrance of air into the nose. Congenital narrowness of the nostrils has already been referred to in connection with the ætiology of post-nasal adenoids. But cases occasionally occur in adults where the occlusion appears to have resulted solely from the dilator muscles of the alæ having lost tone. Such a condition, I believe, has not hitherto been described. In the only two cases I have seen of the affection, one in consultation with Dr. St. Clair Thomson, of Florence, it was associated with other symptoms of chronic rhinitis; but the subjective trouble of inability to breathe through the nose was relieved only by overcoming the stenosis in question. The simplest way of effecting this consists in the insertion into the alæ of a piece of rubber-tubing sufficiently large to distend the alæ comfortably, and not longer than a quarter of, or at most half, an inch. This can be worn both by day and night without being conspicuous, and with the greatest comfort to the patient. In one of my cases the catarrhal condition of the fossæ improved during the use of these dilators to a remarkable extent, and the patient's nights, long disturbed by his efforts at breathing through the nose, became calm and undisturbed. Of the effect upon the other patient I have no information.

8. *Congenital Malformations of the Nasal Fossæ.*

Congenital occlusion of the nares

Occlusion, partial or complete, of one or other nasal fossa, from congenital malformation, is not of very uncommon occurrence. Some cases of adhesion between the inferior turbinated body and an ecchondrosis of the septum, such as have been referred to in Chapter X., are possibly congenital. Also, from lack of definite information, one is inclined to believe that a perforation of the triangular cartilage may in some cases be congenital. But beyond these, total occlusion of the posterior nares is occasionally found, either from the adhesion of the turbinated bodies to a deflected septum, or from the presence of a membrane stretched across the orifice.

See p. 198

No special directions for the treatment of such conditions can well be given, since the course adopted will depend entirely upon the nature and extent of the stenosis. In cases of adhesion of the septum to the outer walls calling for treatment, the saw and trephine would probably prove necessary. In the case of a membranous occlusion of the posterior nares, an opening would be most easily made with the galvano-cautery.

APPENDIX OF CASES, &c.

Case and sex.	Ascribed origin.	Pain or tenderness.	Duration and nature of discharge.	Right or le
1 G. B. Æt. 43. M.	?	Tenderness radiating to ear on percussing malar and nasal bones.	7 years, fœtid.	Left.
2 C. T. Æt. 31. M.	Rhinitis.	None.	15 months, fœtid.	Left.
3 A. C. Æt. 20. M.	?	Ill-defined tenderness.	Many years, not fœtid.	Both side
4 J. S. Æt. 40. M.	Rhinitis.	Severe pain every two or three days, relieved as soon as discharge begins. Tenderness over malar.	14 months, fœtid and caseous.	Right.
5 Mr. R. Æt. 42.	Rhinitis.	Continuous infra-orbital pain and tenderness.	13 years, fœtid.	Left.
6 F. M. Æt. 38. F.	Rhinitis.	"Left face heavy." Tenderness over nasal radiating to alveolar border.	4 years, fœtid.	Left.
7 Mr. R. W. S. Æt. 28.	Apparently began 18 months before with toothache and destruction of pulp with caustics; accelerated 12 months with acute rhinitis.	Intense frontal pain during rhinitis, relieved when polypus appeared; has continued intermittently since, and always on exposure to sun. Tenderness radiating to nose and ear on percussing malar.	18 months	Left.
8 Dr. T. Æt. 58.	?	None.	10 years.	Left.
9 C. C. Æt. 53. F.	Rhinitis.	Neuralgia left face 10 years. Tenderness over nasal and malar bones.	3 years, fœtid.	Left.
10 E. C. Æt. 26. F.	?	Tenderness over malar.	2 years or so. Fœtid and caseous, sometimes bloody.	Left.
11 E. N. Æt. 23. F.	Rhinitis.	Slight tenderness over malar.	3 months.	Left.
12 L. W. Æt. 11. F.	?	?	Ozæna all her life.	Left.

Neoplasm in middle meatus.	Discharge above or beneath middle turbinated.	Polypus.	Carious bone, etc.	Where opened, and remarks.
None.	More from above.	Both sides.	..	Alveolus. Cured in 4 weeks.
None.	Below only.	None.	..	Alveolus. Unimproved in 2 months.
..	Above and below.	Both sides stuffed with polyps.	Left ethmoid carious.	Alveoli. Antra have almost ceased to discharge. Nose still suppurating after 2 years.
Small.	Below middle turbinated and above neoplasm.	..	None.	Alveolus. Still discharging after 3 months.
Well-marked neoplasm.	Discharge beneath middle turbinated and above neoplasm.	None.	None.	(1st) Alveolus and (2d) beneath inferior turbinated. Cured in 3 weeks.
Well-marked.	Discharge between middle turbinated and neoplasm.	None.	None.	1st. Between middle and inferior turbinateds. 2d. Alveolus.
Middle turbinated swollen, œdematous, and folded.	Mostly below middle turbinated, slightly above.	A single polypus from margin of left mid. turb. developed during rhinitis.	None.	On puncturing between middle and inferior turbinateds, no pus. Molar removed, pus fœtid and caseous. Cured in 3 months.
None.	Below middle turbinated.	Mid. turb. granular and œdematous.	Mid. turb. carious.	Alveolus.
..	Above and below.	Mid. turb. granular and œdematous.	..	Alveolus. Cured after 9 months.
..	Between polyp and outer wall.	Polyps crowding mid. turbs., both sides.	..	Alveolus.
Œdematous neoplasm.	Between middle turbinated and neoplasm.	..	Mid. turb. carious.	Alveolus. Discharge ceased with cure of nose in about 4 months.
Neoplasm left, none on right side.	Pus between middle turbinated and neoplasm.	..	..	1st. Puncturing between middle and inferior gave pus. 2d. Opened also from alveolus. Right antrum also opened. No pus.

Case and sex.	Ascribed origin.	Pain or tenderness.	Duration and nature of discharge.	Right or left.
13* Mrs. S. Æt. 33.	?	None.	4 years.	Left.
14 Mrs. J. Æt. 43.	?	None.	30 years, fœtid and caseous.	Left.
15 Miss R. E. Æt. 21.	Rhinitis accompanied with severe supra-orbital pain.	Neither.	4 years, pus occasionally fœtid and sanious.	Left.
16† Mrs. C. Æt. 53.	Rhinitis.	Every day at 11 A.M., supra-orbital formication and pain lasting an hour, when pain begins. Some frontal tenderness.	15 months, slight occasional fœtor.	Right.
17 E. W. Æt. 32. F.	?	Heavy supra-orbital and malar pain. Tenderness on percussion.	3 months.	Left.
18 A. C. Æt. 40. M.	?	No pain.	3 years.	Left.
19 Mrs. G. Æt. 70.	Carious molar.	"Face-ache" and swollen face.	1 week.	Left. Nose normal.
20 A. F. Æt. 30. M.	Rhinitis.	No pain.	2½ years.	Left.
21 A. S. Æt. 20. M.	?	No pain.	3 years.	Both sides.
22 F. L. Æt. 40. M.	Rhinitis.	Left supra-orbital pain 3 years. Tenderness. Pain begins at one o'clock daily, gradually diminishing till evening.	10 years.	Left.

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* Seen with Mr. Hames of Hyde Park.

Neoplasm in middle meatus.	Discharge above or beneath middle turbinated.	Polypus.	Carious bone, etc.	Where opened, and remarks.
Nose perfectly normal.	Below middle turbinated.	..	None.	Alveolus. Failed to open from nose.
Neoplasm.	Discharge between left middle turbinated and neoplasm.	..	None.	Alveolus. Cured in 6 weeks.
None.	Above and below.	Several small polypi.	Carious perforation of left mid. turb. bone.	Alveolus. After antrum was cured pus flowed from above middle turbinated, which was removed and ethmoidal cells broken down. The latter were washed daily for 8 months. Cure almost complete.
None.	Above and below.	None.	None.	Alveolus. Two days after opening pain and formication ceased. Antrum ceased to discharge in few days. Pus still flowing from above and below middle spongy bone 8 months after.
arge fleshy growth covered with polypi.	Below.	Several polypi beneath mid. turb.	None. Abscess of mid. turb. bone.	Alveolus. Abscess had opened into antrum, whence pus flowed through *ostium maxillare* into nose. Cavity filled with red granulations. Cured in 8 months.
ony growth beneath middle turbinated.	Pus between growth and middle turbinated.	None.	None.	Alveolus. Discharge continues 11 months after.
None.	Beneath middle turbinated.	None.	None.	Molar extracted. Patient cured in a few days without further treatment.
None.	Beneath.	Polypi.	No ascertainable caries.	Alveolus. Almost cured after 6 months.
..	Beneath middle turbinated.	Polypi.	No ascertainable caries.	Almost cured after 11 months.
..	Beneath middle turbinated.	Œdematous granulations in middle meatus.	Caries of outer wall of middle meatus.	Still under treatment.

† Seen in consultation with Mr. Macnamara.

Case and sex.	Ascribed origin.	Pain or tenderness.	Duration and nature of discharge.	Right or left.
23 J. P. Æt. 24. M.	Influenza.	Swelling, pain, and tenderness over right brow every morning at 9 A.M. Face illuminated: right side very dark.	3 months.	Right.
24 A. M. Æt. 40. M.	Carious molar.	No pain. Face illuminated: left side dark.	4 months.	Left.
25 H. J. Æt. 20. F.	Rhinitis.	Left malar tender. Supra-orbital neuralgia. Face illuminated: left very dark.	12 months.	Left.
26 A. H. Æt. 25. F.	?	No pain or tenderness. Illuminated: left side darker.	18 months.	Left.
27 C. D. Æt. 22. F.	?	No pain or tenderness. Illuminated: left side slightly darker.	14 years.	Left.
28 W. D. Æt. 30. M.	Influenza.	Neuralgia every morning, 11 till 1 o'clock: frontal tenderness. Illuminated: right very dark.	7 months.	Right.
29 A. D. Æt. 38. F.	?	No pain.	5 years.	Right.
30 M. W. Æt. 31. M.	Influenza.	Occasional severe pain. No tenderness. Illuminated: left very dark. Teeth carious.	12 months.	Left.
31 R. B. Æt. 44. F.	?	No pain. Illuminated: left slightly darker.	3 months.	Left.
32 W. H. J. Æt. 65. M.	Acute rhinitis: no carious teeth.	No pain, but great feeling of oppression in head and loss of memory.	6 months.	Right.
33 Col. J. Æt. 63.	?	No pain. Antrum illuminated: left face very dark.	Many years.	Left.
34 Miss H. Æt. 15.	Rhinitis: teeth perfect.	No pain or tenderness. Sinus above canine running into antrum.	4 months.	Right.
35 Mrs. D. Æt. 38.	?	Severe frontal headache and malar tenderness. Illuminated: right face darker.	?	Right.

Neoplasm in middle meatus.	Discharge above or beneath middle turbinated.	Polypus.	Carious bone, etc.	Where opened, and remarks.
None.	Beneath middle turbinated.	Granulations replacing part of mid. turb.	Caries of infundibulum.	Pain ceased with evacuation of antrum.
Bulging of antral wall.	Beneath middle turbinated.	None.	None.	Carious molar extracted: alveolus carious.
Grans. below middle turbinated.	Pus among grans.	Caries of middle turbinated.	..	First molar removed: pus fœtid.
..	Beneath middle turbinated.	Polypus.	None.	Opened from canine fossa: pus not fœtid.
..	Above and beneath middle turbinated.	Polypus.	None.	Antrum opened from canine fossa: pus not fœtid.
..	Beneath middle turbinated.	No nose disease.	None.	Canine removed: small quantity of pus. Complete relief to pain.
None.	Beneath middle turbinated.	No disease of nose.	One.	Opened from alveolar border: pus fœtid.
None.	Beneath middle turbinated.	No nose disease.	..	Opened from alveolus. Rapidly cured.
None.	Beneath.	Polypus.	None.	Opened from alveolus: pus not fœtid.
reat bulging of antral wall.	Beneath.	No disease of nose.	..	Opened above inferior turbinated, and after from alveolus: pus very fœtid.
None.	Beneath middle turbinated.	Polypus.	..	Opened on alveolar border: large quantity of fœtid pus.
None.	Above and beneath middle turbinated.	No disease of nose.	..	Sinus enlarged: fœtid pus.
None.	Beneath middle turbinated.	Simple rhinitis.	..	Opened from alveolus: fœtid discharge. Pain relieved.

MISCELLANEOUS CASES

CASE 36. PSEUDO-EPILEPSY—POST-NASAL ADENOIDS—OPERATION—CURE

MASTER H., æt. ten years, a boy looking the picture of health, was sent to me by Dr. John Davis, of Nottingham, on account of some obstruction in the nose, which, he thought, might be responsible for the convulsions from which the patient had suffered for the previous four years. For the last eighteen months he had been under the care of Dr. Davis, to whom I am indebted for the following account of the seizures. The fits averaged two or three a week, though sometimes he would have only one a week for several weeks, or perhaps only one in two weeks. They always occurred in the night and during deep sleep. The fits were always more frequent in damp or wet weather, or after smoking, a vice over which his mother had no control. The malady had been diagnosed as epilepsy by three eminent medical men, though none of them had actually witnessed an attack. Dr. Davis further wrote as follows: "I was called out about thirty times by night to see him, and diagnosed not epilepsy but some obstruction at the back of the throat and nose. The seizures were of a suffocative convulsive character; the boy would get blue in the face—distinctly cyanotic. He would then throw his arms and legs about struggling for breath till awake, when all the symptoms would disappear. When in deep sleep, a very thin and narrow strip of tissue paper would not even quiver in the least degree when held in front of the left nostril, but would wave a little in front of the right. In superficial sleep the breath would make it waver in front of both nostrils, especially the right. During the last year the fits have been much more frequent."

On one occasion I had an opportunity of examining the patient during sleep, though I had not the good fortune to witness an actual seizure. The patient was snoring profoundly, and as the stertor became deeper and louder there arose a distinctly laryngeal stridor combined with the nasal sound. The face grew unmistakably dusky, though, previous to the point where his mother expected the convulsion to occur, he flung his arms up and awoke. Falling asleep again, the train of symptoms was repeated, although in a milder form. On examining the patient in the consulting room, it was at once apparent that the post-nasal space was obstructed. The patient presented the small pinched nose and open mouth characteristic of the affection. There was no anterior nasal stenosis or deafness. The hard palate was high and narrow to a conspicuous degree; while the soft palate, uvula, and posterior wall showed the pathognomonic appearance found in connection with post-nasal growths. No digital examination was made; but on the following day the patient was placed under an anæsthetic by Dr. Silk, and a large quantity of adenoid vegetations was removed. Some difficulty was experienced by the unwonted smallness of the post-nasal space.

The subsequent history is the important point in the case. For three months the boy had no snoring or convulsive attack. At the end of that time he caught a severe chill from becoming wet through, and afterwards having his hair cut and shampooed at 9.30 P.M. A cigar added to the trouble, perhaps, and at midnight Dr. Davis was called out once more for one of the old attacks. On this occasion Dr. Davis remarked on the great improvement in the nasal breathing. Since then, up to the present time, there has been no appearance or threatening of an attack. And we may conclude that the patient owes his recovery to Dr. Davis's skilful recognition of the fact that the obstructed nasal respiration was the primary source of the convulsive seizures.

It is interesting to note in this connection that Mr. Howard Marsh has recorded two cases in which children died of convulsions after being operated upon for harelip. His explanation of the phenomenon is that the customary breathing space having been curtailed by the operation, the children became asphyxiated. Like cleft-palate, harelip is in all probability frequently, if not usually, associated with post-nasal adenoids.[1]

CASE 37. POST-NASAL ADENOIDS—DEAFNESS—ANOSMIA —ILLUSTRATING THE FUTILITY OF IMPERFECT OPERATIONS—REMOVAL WITH FORCEPS—CURE.

S. W., æt. fourteen, had breathed with difficulty through his nose, had generally snored at night, and had been more or less deaf almost since infancy. He had further been subject to swelling of the glands of the neck, and to frequent colds in the head. All the symptoms, especially the deafness, had been considerably worse during the last four years. The patient had been under the care of an aurist for the past two years. On three occasions he had had the posterior wall of the naso-pharynx scraped with the finger-nail. For three or four weeks after each operation the hearing had improved, but only to relapse into its former condition. He had also used chloride-of-ammonium vapour very assiduously. Nevertheless, for the past twelve months there had been very little variation in the deafness. There was no mental ineptitude. Several members of the family had symptoms of post-nasal growths. On admission to the hospital, he was observed to present the typical appearance of post-nasal adenoids. His mouth was open, the alæ were small and pinched, and he had the aspect of stupidity so characteristic with these patients. There was almost complete anosmia, the patient having no recollection of being able to smell. He heard the watch tick at one and two inches respectively at the right and left ear. The membranes were greatly depressed and dusky in colour. The mouth presented a contracted and highly arched palate, the incisors overlapping one another. The tonsils were but slightly enlarged, and the posterior wall of the pharynx was free of granulations. The palate was very feeble in its action. On examining the post-nasal space a large mass of growths was seen projecting from the posterior wall.

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[1] *Clinical Lectures and Essays*, by Sir James Paget, edited by Howard Marsh, 1875.

The growths were removed with the forceps, and proved to be exceptionally tough. The post-nasal space was almost completely filled, so that the operation was by no means easy. The growths are illustrated on p. 266, Fig. 60; they weighed immediately after removal 123 grains.

Five days after the operation the patient heard the watch tick at about a distance of eight or ten inches on both sides. Inflation by Pollitzer's method was performed daily, and in another week the hearing was to all intents perfect. Up to the present time—two years after operation—it has remained uniformly good. The sense of olfaction is completely restored.

For the above notes I am indebted to my house-surgeon, Mr. Brackenbury.

CASE 38. FIBROUS TUMOUR OF THE NASO-PHARYNX—OPERATION.

M. P. S., æt. twelve years and eight months, consulted me on 23d March 1888 with the complaint that his nose was stopped up. He had always been rather frail, and was considerably undersized. He was considered to be delicate by his father, who stated that he had "a very high nervous organisation, was restless and energetic." Four years ago he had scarlet fever, but recovered very satisfactorily, there having been no *sequelæ*. His father had been troubled with a catarrhal throat affection for thirty-five years, as well as at one time with grave disease of the lungs, from which, however, he had completely recovered. The patient's mother had died six years previously of rapid consumption. The first appearance of the present symptoms occurred twelve months before, when the boy was noticed to have a prolonged "sniffling cold in the head." From this he had never recovered; and, ultimately, it was considered to have produced some stoppage in the nose which impeded the breathing. The speech, moreover, had lately become very indistinct, the swallowing was occasionally difficult, and he had become deaf to a distressing degree in both ears. Dr. Bell, of Uppingham, kindly sent me a report of the patient's present condition, in which he stated that there was obviously some neoplasm behind the soft palate which pushed the latter forwards and could easily be felt with the finger. There had been no nose-bleeding or drowsiness. On examining the growth, it being easily brought into view by lifting the velum with a palate-hook, an enormous tumour was observed to fill the whole of the post-nasal cavity. The surface was uniform and smooth, presenting a colour rather paler than the mucous membrane of the pharynx. There were no vessels of any sort seen ramifying on the surface. On attempting to pass the finger into the cavity, the growth was found to fill the naso-pharynx so completely that it was scarcely movable. Hence it was impossible to ascertain its attachments or the full extent.

On the 26th of March I removed the growth under chloroform administered by Dr. Silk. The operation was a matter of considerable difficulty, seeing that the neoplasm was so tightly packed that a noose of wire was passed over it only with great difficulty. Moreover, so dense was the structure, that stout No. 6 piano-wire twice broke through. Consequently an incandescent loop was attempted. But so great was the bulk of the pedicle that very little impression was made in this manner. Finally, a pair of strong curved forceps was introduced behind the velum up to the summit of the attachment, and, shred by shred, the attachment was torn through. A few remaining strands were then separated from the vault of the naso-pharynx. There was scarcely any hæmorrhage during the operation.

The subsequent history of the case I am able to give only in a very partial manner. On the 10th of April I again saw the patient, and cauterised freely the stump of the growth, which was now ascertained to arise from the base of the sphenoid on the right side, extending thence into the posterior ethmoidal cells, etc. The hearing was now perfect. On the 18th the slough had come away, and a good view of the diseased surface could be seen with the post-rhinal mirror. Some of the pedicle still remained in the neighbourhood of the superior turbinated body. There had been no hæmorrhage at any time after the operation. Here, unfortunately, my history of the case closes; for, without explanation, the patient was placed in the hands of a surgeon with whose name I was and am unacquainted, and who declined to meet me, as I suggested, in the hope that a consultation might be of some help to him in the diagnosis and further conduct of the case.

CASE 39. HAY FEVER—ECCHONDROSIS OF THE TRIANGULAR CARTILAGE—CURE.

Dr. L., of Dunmow, Essex, consulted me on the 9th of April 1888, complaining of the usual symptoms of hay fever. The affection consisted in a constant catarrh of the nose, which was greatly aggravated by the least exposure to air or dust at any period of the year. During the hay season the symptoms were always greatly aggravated, so that for the months of June and July he was compelled to visit his patients with his eyes protected with blue goggles, and his handkerchief always in his hand. He had consulted various specialists without obtaining any relief. On examining the nose, the only abnormality appeared to be a small ecchondrosis of the triangular cartilage with vascular tumefaction of the inferior turbinated bodies. The fossæ on both sides were below the average capacity, so that a very slight swelling of the inferior turbinated tissue would bring the adjacent surfaces of mucous membrane in contact. The middle turbinateds on both sides were perfectly healthy, and there had never been any purulent discharge. Consequently one scarcely perceives how the ethmoid bone could be considered gravely diseased. Dr. L. had been in the habit of using a 5 per cent solution of cocaine; but the effect he found very transitory, and he was compelled to use it in increasing quantities and more frequently. Consequently he had arrived at the conclusion that it was doing him real harm, both locally and constitutionally. On the patient's first visit I cauterised the inferior turbinated bodies, and prescribed a spray containing a twelfth of a grain of chromic acid to the ounce of water, to be used for five minutes twice a day as soon as the hay season began its work of irritation.

On the 9th of June he wrote to me that he was having "no end of sneezing just now; it began about four days ago in style!" On the 3d of July he wrote further that he had patiently used the chromic acid without any benefit whatever. "The solution of cocaine," he says, "makes me quite comfortable for about an hour. I don't sneeze as much as I did or anything like it; but, what is more uncomfortable, my nose 'shuts up.' I have had asthma this year too, which I have not had before."

On the 12th of July, the severe symptoms having somewhat abated, I removed the ecchondrosis of the septum, and a fortnight later I further cauterised the inferior turbinated bodies. The result of the treatment was that the patient remained perfectly free from symptoms during the following months, except when he took an ordinary cold, which proved far less severe than on previous occasions, until the hay season of the following year, *i.e.* of 1889. He still remained in almost perfect comfort; he discarded the blue glasses, he scarcely ever sneezed, and the handkerchief was very little in demand. But, as happened after the slight improvement in the symptoms during the previous summer, he suffered still more from hay asthma, after exposure to an atmosphere laden with grass pollen, although there were no nose-symptoms whatever.

Until the improvement in the sneezing, etc., began, there had never been any asthma whatever. A single case such as this would appear to blow to the winds the theory that the asthma is the result of reflex irritation in the nose; on the contrary, it would rather appear that the nose being freer, the inspired air was less effectually filtered of its irritant particles, which, passing into the bronchi, caused a spasm of their muscles from direct irritation of their mucous surface. Fortunately, the patient experienced very little discomfort from the asthma, considering that it bore no comparison with the former troubles.

CASE 40. CHRONIC RHINITIS DEVELOPING INTO POLLEN FEVER—REFLEX COUGH—SPASMODIC SNEEZING—CURE.

Mrs. A. consulted me in March 1888 complaining of hay fever, which troubled her all the year round. But last year, for the first time, she suffered from intense aggravation of the symptoms during June and July, in which months she was distinctly worse in the country than when in town. The sneezing began every morning with intense irritation in the left nostril, lasting the whole morning or longer. She had also what she called a croupy cough without any expectoration, it being always worse after an attack of sneezing. After termination of the attack, she would complain of the right side of the nose feeling very dry. Objective examination showed the left side of the septum to be slightly hypertrophied, so that it lay in contact with the anterior extremity of the middle turbinated body. The latter was somewhat enlarged and distinctly dry on its surface. The treatment consisted in the application of the electric cautery to the offending cartilage, so as to destroy it to a considerable depth. Since then she has had no sneezing whatever, and the middle turbinated has regained its normal appearance of moisture, although it is distinctly hyperplastic.

This case is but a type of six others I can recall of almost identical history.

CASE 41. HAY FEVER, WITH HYPERTROPHY OF INFERIOR TURBINATED BODY — OPERATION FOLLOWED BY GREAT IMPROVEMENT.

Lord X. consulted me in November 1888 complaining of hay fever, from which he had suffered for the greater part of his life. He had consulted specialists and physicians without ever obtaining more than the most temporary relief. His nose had been authoritatively stated to be perfectly free of any abnormality, although he could never breathe through it with any degree of comfort. The symptoms were all typical of pollen-irritation during the hay season, although he suffered very much from catarrh during the whole year, and would take cold upon the slightest provocation; and this in spite of his being otherwise in perfect health. Perhaps he presented something of the neurotic temperament. On examining the interior of the nose, I observed that the nasal fossæ were by no means contracted in their osseous parietes. The inferior turbinated on the right side was enormously enlarged from true hypertrophy, and from its posterior extremity a tumour the size of a small walnut was hanging, which pressed heavily upon the velum. The speech in consequence had a distinctly nasal quality. On the left side there was a very prominent ridge running from before backwards, and encroaching upon the inferior turbinated body, which was somewhat enlarged from vascular tumefaction of its erectile tissue.

The treatment consisted, in the first place, in the removal of the post-nasal tumour. This was effected with the Mackenzie-snare, guided through the anterior nares, and, with the assistance of the post-rhinal mirror, hitched over the growth. Twenty minutes altogether were occupied in the severance of the mass, which, before the final turn of the screw, was drawn into the nasal fossa so as to obviate all risk of its falling into the pharynx. With a pair of curved vulsellum forceps the tumour was seized from behind, and withdrawn through the post-nasal space and mouth. It was from sections of this specimen that the woodcuts on pp. 14 and 15 (Figs. 4, 5, and 6) were drawn by Mr. P. S. Hutchinson. This operation alone gave the patient considerable relief, so far as the breathing was concerned. Not a drop of blood was lost, although the patient afterwards proved that he was of a somewhat hæmorrhagic temperament. A month later he complained that the sneezing began most distinctly in the left nasal fossa, and that it was now from this side that the flow of mucus proceeded. The inferior turbinated was consequently cauterised. This gave a certain amount of relief; but on 11th February I essayed to remove the projecting ridge in the manner detailed on p. 203. This, however, had to be abandoned on account of the very free hæmorrhage, which gave some trouble for four or five days afterwards. Consequently, the destruction of the ecchondrosis was completed by a series of applications of the galvano-cautery. Finally, some small excrescences were removed from the right inferior turbinated. This carried the treatment into the end of April, when it was considered, in view of the approaching hay season, to postpone further treatment till that was over. In the year of 1889 the summer began fully three weeks earlier than usual, and with it the hay symptoms. In the case of Lord X., they persisted through the usual period, but were greatly mitigated in severity. Thus, after exposure to the usual source of irritation, on regaining the shelter of the house the attack would subside in half an hour or so, instead of persisting the whole of that and perhaps the following day. Yet although the improvement was very striking, the patient was not cured of the susceptibility to the pollen. In the following autumn and winter, however, he expressed himself as being wonderfully comfortable and free from any catarrhal trouble.

The following extract from a letter lately received from my patient in response to a question I had asked, as to whether he had ever experienced the hay symptoms when in Australia, is of considerable interest in reference to the precise fact it contains of the patient's susceptibility to one special variety of pollen: "There was only one place where I had hay fever badly, and that was on a big grass farm in Victoria not far from Melbourne. I was there just before Christmas, which is midsummer, as you know, in Australia. On this farm grew splendid crops of rye grass in flower, and which, shortly after I saw it, was ready for cutting. I was perfectly well till I reached the station near this farm. There was a strong wind blowing; and no sooner did we get into the open carriage that was to take us to our host's house than I was suddenly and severely smitten with grass fever of the most intense kind. I call it grass fever, as it is undoubtedly the pollen of the grass, and particularly rye grass, which affects me most. I was so ill that I was obliged to spend the whole day in the house until leaving the next morning, when I was again very bad till we had got into the train and we had left that grass region. The same thing happens to me in England. I am a prisoner if the house is surrounded by uncut ripe grass. I again had a touch of the hay fever coming home through America in June; but nowhere else did I have it, and I am always perfectly free from it in the tropics, where this kind of grass does not grow. Flowers there do not seem to affect me."

CASE 42. ILLUSTRATING THE IMPORTANCE OF THE NOSE IN AFFECTIONS OF THE LARYNX—SYPHILITIC OZÆNA—CURIOUS INFLUENCE OF HEREDITY.

R. B., mason's wife, æt. thirty-seven, consulted me on 10th May 1886 at the Hospital for Diseases of the Throat, complaining of dysphonia. She had been married fourteen years, had had four children, and one stillborn, but no miscarriages. The children were stated to be healthy, though they all subsequently came under my care, the two eldest being cases of typical ozæna; the third having a well-marked lupus of the nose, with complete destruction of the triangular cartilage; and the youngest having a thick, muco-purulent discharge from the nose, wide fossæ, but no ozæna. For the last fourteen months the patient had suffered from complete aphonia, and had been attending the Brompton Hospital without relief. There had been for the same period a troublesome cough. The only pulmonary symptoms were a slight dulness beneath the right clavicle. She was profoundly anæmic, menstruating profusely every fourteen days, and much emaciated. There were no night sweats or hæmoptysis. For five or six years past she had been troubled with attacks of pain across the bridge of the nose every six months or so, followed and relieved by a profuse puriform discharge from the anterior nares. There was a well-marked ozænic odour in the breath, but no anosmia. The bridge of the nose was flattened and sunken to such a degree as indicated the probability of syphilis being the origin of the mischief. On examining the interior of the nose, both middle turbinateds were found greatly enlarged with patches of carious bone on their under surfaces. From the outer wall of the middle meatus, beneath the left middle turbinated, a large, firm, red neoplasm was growing, covered with mucous membrane. The inferior turbinateds were collapsed, but not atrophied. There was an aggravated pharyngitis sicca. A laryngoscopic examination showed the glottis to be almost obliterated. The vocal cords, from ulceration of their margins, were reduced to a thin red line, while beneath them was an opaque white mass of subglottic thickening. The posterior half of the vocal cords was obscured by an œdematous ulceration of the inter-arytenoid fold. The cartilages were swollen and œdematous, the right being deficient in mobility, and there was œdema of the right aryteno-epiglottic fold. As an out-patient she made no progress, and on 1st June I took her into the hospital. Assuming that the throat affection was mainly due to the perpetual irritation to which it was exposed from the nose, I set about remedying this; in the first place, by keeping the nose constantly clean, and in the second, by removing the neoplasm attached to the middle turbinated, and scraping the carious spots on its under surface. In a fortnight's time the subglottic thickening was rapidly disappearing and the œdema subsiding, the only medicine being codliver oil, and the local application an alkaline spray to the larynx to keep the mucous surface free of crusts. She was then ordered a spray of perchloride-of-iron, three grains to the ounce of distilled water. In another four weeks the voice was completely restored. During this period there had been an attack of pain across the bridge of the nose, followed by a discharge flowing from above the middle turbinated, presumably from the anterior ethmoidal cells. Since that time the voice, though occasionally husky, from the substantial thickening of the inter-arytenoid fold, has remained good. About a twelvemonth subsequently the patient presented herself again with a perforating ulcer of the soft palate, additional evidence that the case was syphilitic. The ulceration rapidly disappeared under iodide.

As already mentioned, I have at one time and another had the four children under my care for affections of the nose. None of them exhibited any signs of constitutional syphilis.

CASE 43. ILLUSTRATING THE CURE OF SIMPLE OZÆNA, WITH THE CURE OF ANOSMIA.

Miss A. B., æt. sixteen, daughter of a clergyman, consulted me in October 1887, complaining of an offensive discharge from the nose, hoarseness, and general loss of health. The trouble had existed ever since receiving a bad blow on the nose when she was ten years old, this having been followed by severe epistaxis and ecchymosis. Since then she had completely lost the sense of smell. She was, moreover, profoundly anæmic. An examination of the interior of the nose revealed complete collapse of the inferior turbinated bodies, and an ecchondrosis of the right side of the septum completely occluding access to the middle meatus. The middle turbinateds were normal in size, although there was great widening of the olfactory fissures. This doubtless corresponded to a general widening of the bridge of the nose as remarked externally. The whole of the inferior turbinated bodies were incrusted with inspissated muco-pus, while the middle turbinateds, especially on their under surface, presented a similar appearance, except that the secretion was more fluid. There was the marked fœtor so characteristic of the disease.

The treatment consisted in daily washings in the manner detailed in Chapter VIII. p. 163. This extended over a period of eight weeks. At the end of that time I removed the ecchondrosis of the right side of the septum, in order to admit the air to the middle meatus, and also for the purpose of securing more efficient drainage. At the end of three months the secretion from the nose was perfectly free from pus, and the breath was quite sweet. Moreover, the sense of smell, greatly to my astonishment, began to return. There was, however, in consequence of the continued collapse of the erectile tissue, a strong tendency for the mucus to dry up in the inferior meatus. Accordingly, I resorted to the means for augmenting the blood-supply detailed on p. 167. This treatment the patient conducted with great intelligence. After three months' persistence in it distinct improvement was manifested, although the patient declared that "the nose began to run more" almost immediately, in itself a very valuable point. Her sense of smell completely returned, and, a matter the patient considered of considerable importance, she could sneeze and take cold like any one else. Until the beginning of December 1889 she remained perfectly well, with an occasional washing of the nose with Sanitas-fluid. She then contracted an attack of epidemic influenza, and, after recovering from this, the old discharge returned and something of the ozænic stench. But a very short course of treatment restored the nose to its healthy state; and the patient may now be considered almost a perfect cure.

CASE 44. TUBERCULOUS TUMOUR OF THE SEPTUM NASI—CURE.

C. C., æt. fourteen years, son of a coachman, applied at the Hospital for Diseases of the Throat in July 1887 complaining of obstruction in the nose. The history given was that, three months before, he had fallen against a stone stair and had broken the nose. It had been very painful and swollen for some days afterwards, having bled profusely at the time of the accident. Since then the passages had gradually become more obstructed, until it became impossible to breathe through the nose at all. The patient was of opinion that it had become wider and flatter the last two or three weeks. In other respects the boy presented a picture of perfect health. He had never had a day's illness that he could remember, and his family history was in every respect remarkably good.

On examining the anterior nares, the whole of the nasal fossæ on both sides were completely filled with a dusky red, coarsely and irregularly lobulated mass, presenting a marbled appearance, from the presence of yellowish-gray streaks and spots; while vessels, large enough to be visible to the naked eye, were ramifying over the surface. It was soft and exceedingly friable, bleeding easily as soon as the surface was broken. Nevertheless, it appeared to be covered by a thin layer of mucous membrane. It did not bleed spontaneously, nor had there been any purulent discharge.

Chloroform having been administered by my then house-surgeon, Mr. P. S. Hutchinson, the growth was removed from the left nasal fossa in a single mass by means of an ordinary pair of polypus forceps, the portion filling the right side being unintentionally pulled through a large perforation in the septum. The neoplasm was removed so easily that it appeared to have had no attachments. Nevertheless, the hæmorrhage was very profuse, but ceased spontaneously. The growth after removal presented an appearance identical with that already described. Throughout its structure it was exceeding friable, crumbling down under the finger. Towards the centre it was somewhat more consistent. Hæmorrhagic spots were scattered through its substance.

Subsequent examination of the nose revealed the fact that the growth had sprung entirely from the margin of a perforation, the size of a florin, in the triangular cartilage. This margin was freely cauterised with the electric cautery, and the patient kept under observation for three months. During the whole of this period there was at no time the slightest appearance of any recurrence. At a further interval of three months the patient was again seen, when he presented no trace of any disease in the nose.

Two years and five months after the operation I saw him again. He was in perfect health. The perforation, of course, remained in the septum, but the margin was intact and completely cicatrised.

The microscopical structure was kindly examined for me by Mr. Watson Cheyne, who assured me of its tuberculous nature.

CASE 45. TUBERCULOUS ULCERATION OF THE PITUITARY MUCOUS MEMBRANE, WITH THE FORMATION OF ENORMOUS MASSES OF GRANULATION TISSUE.

Mrs. W., a nurse, was sent to me in October 1888 by Dr. Grigg. She had been complaining of a purulent discharge and obstruction of the left side of the nose for the past five years, with externally obvious distension of the left side of the nose. The discharge would sometimes flow into the pharynx, especially when she was unable to blow the nose, which was usually the case. She stated that for a few weeks previously she had been suffering from a cough, for which she had consulted Dr. Douglas Powell. Her temperature had been above normal, and there had been a suspicion of some affection of the left apex. However, at the time of my examination there was no evidence of lung disease, and her cough had ceased. Nor up to the present time has there been any further evidence of lung mischief. Her family history was good, and she had never suffered from any serious illness.

On examining the interior of the nose, the left fossa was found tightly blocked with a collection of discrete fleshy growths, varying from the size of a pea to that of a bean, of a pale pink colour, smooth and uniform on the surface, and bathed in a thin purulent secretion. They appeared to be nearly all attached to the septum, those situated most anteriorly being almost projecting from the nostril; a few were growing from the outer wall of the upper half of the vestibule. The left nasal bone was considerably distended by pressure from within. On the right side there was an extensive ulceration confined to the septum and covered with inspissated mucus. On the removal of this the ulceration presented the typical form as seen in tuberculosis of the pharynx. It was very superficial, the margins but slightly increased in colour; and, as there was little to distinguish the ulcerated from the sound surface, the former appeared badly defined. Added to this the important fact that the whole mucous membrane was remarkably anæmic, and we have all the characteristic points in tuberculous ulceration of mucous membrane. This side of the nose would occasionally bleed profusely. There was no fœtor in the pus, although there was a strong tendency towards desiccation in the right side. Owing to the impervious condition of the left fossa, the secretion there had no such tendency. The patient had been operated on several times, under an anæsthetic, by more than one surgeon, with snares, sharp spoons, and the electric cautery, and very various opinions had been expressed as to the nature of the disease. None of the operations had afforded any relief, and had entailed a serious amount of subsequent suffering. Microscopical examination of the growths in the left fossa proved them to consist entirely of granulation tissue: no bacilli could be found. The patient suffered also from epiphora, although, subsequently, the outer walls of the fossæ were found to be perfectly free of the disease. There was a purulent discharge from, and a large perforation of, the left *membrana tympani.*

The treatment consisted in the careful cauterisation of the granulation growths with chromic acid, or their removal one by one with the snare. The wound was subsequently dusted with iodoform. In fact, the treatment was conducted upon the same general principles as if it were an ordinary ulceration of the cutaneous surface. The disease was proved to extend no farther back on the left side than the triangular cartilage, although on the right the vomer was implicated. After four months' treatment in the above-mentioned manner complete cicatrisation of the left side had taken place, while that on the right side was very greatly improved. At that time the patient went on a voyage of nine weeks, and came back with the lower part of the triangular cartilage broken out in ulceration once more. The upper half in the process of cicatrisation had become adherent to the outer wall of the vestibule in certain spots. This remained intact, while there was no fresh appearance of disease on the outer wall. The ulceration on the right side had extended to its former limits. Thinking that a too thin cicatrix had been the result of healing over an unsound inflammatory base, I now scraped the whole surface with a sharp spoon, and the left side is once again perfectly healed. The right side also is now quite sound after extensive scraping.

No constitutional treatment, including full doses of iodide of potassium, at any time appeared to have any influence on the course of the disease.

CASE 46. SUPPURATION IN THE SPHENOIDAL SINUS—OPERATION—CURE.

A. S., æt. twenty-six, single, applied at the Throat Hospital, complaining of dryness in the throat and the accumulation of phlegm. The latter sometimes had an unpleasant taste; but he did not think any smell was noticeable to bystanders. Occasionally he would blow crusts of inspissated mucus from the nose; but he did not think this was associated in any way with the affection of the throat. He was very thin and anæmic, and had been gradually losing strength for the past eighteen months. He thought his throat had troubled him longer than this. He had never had any serious illness, and could give very little information as to his family history. He had never had syphilis. On examining the throat the posterior wall of the pharynx was found covered with a mass of inspissated, blackened, purulent secretion, obviously proceeding from the post-nasal region. Although black in the centre, one judged its nature to be purulent, from the fact that the edges were of a yellow opaque appearance. On examining the post-nasal cavity, the crust was observed to be adhering almost entirely to the right side of the posterior wall. About midway up the incrustation ceased, its place being taken by a thin yellow streak of pus, extending upward till it disappeared in the nasal fossa, in front of the region occupied by the sphenoidal sinus. The posterior end of the superior turbinated body also was covered with pus. Anterior rhinoscopy revealed collapse of the erectile tissue in the inferior meatus, owing to the general anæmia. Thus the inspissation was largely accounted for. This collapse was of advantage in permitting a view of the posterior nares from the front. There was, moreover, an unusually wide olfactory fissure which permitted a view of the anterior surface of the sphenoidal sinus (see Figs. 44 and 47). Here also the pus was seen covering the surface in question. The course of the purulent flow could not be so distinctly traced on every occasion. Sometimes there was no obvious connection between the mass in the naso-pharynx and the region of origin. If the patient were requested to lie, the night before his visit to the hospital, on his left side, the incrustation would be seen occupying, to a large extent, the left side of the naso-pharynx, thus proving the position of the mass of inspissated mucus to be the result of gravity. A certainty of the diagnosis was made only after watching the case for six or eight weeks. The only question was whether the pus were flowing from the sphenoidal sinus or the posterior ethmoidal cells. In the only unequivocal cases of the latter which I have seen, the pus did not flow over the posterior wall of the naso-pharynx, which indeed could happen only when in the supine position ; whereas, in a supposed case of empyema of the sphenoidal sinus, it would obviously flow in that direction when the head was held upright, as well as supine. The only position in which it would gain access solely to the nose would be in the prone. On the other hand, an occasional bend of the head forwards would account for some of the pus from the sphenoidal sinus finding its way on to the superior turbinated body. A consideration of all these points ultimately led me to open the cavity. This was effected in the following manner :—A stout, blunt probe was thrust upward and backward through the anterior nares, on a level with the line of junction between the perpendicular plate of the ethmoid and the vomer, behind and above the middle turbinated bone, keeping the while close to the septum. Having reached the anterior face of the sphenoidal cells, the probe was gently moved until a roughened depression was encountered. Into this the instrument was then thrust, and was found to enter the cavity. The margins of the opening were further broken down, and the nose was washed out. Only a small amount of pus was obtained, and some doubt was entertained as to whether the cavity had actually been reached. On the patient's next visit, however, he declared that for the first time since the trouble began he had been perfectly free of discharge and discomfort in the throat. He remained in this comfortable state, his health improving at the same time to a striking extent, for another five weeks, when a little pus made its appearance in the naso-pharynx in the old manner. Accordingly the operation was repeated with no difficulty; and for the last two years, but with the occasional appearance of a little pus, the patient has remained perfectly well.

In this case I have given the points of diagnosis with some minuteness, dwelling somewhat lengthily on the difficulties, for the direct purpose of demonstrating the doubts such cases must always present as to a positive diagnosis. I am not aware that any similar case has been sufficiently described; but in all probability the disease is not so uncommon as is supposed.

CASE 47. ASTHMA—NASAL OBSTRUCTION—OPERATION AND CURE.

Rev. H. J., æt. thirty, consulted me early in August 1890, complaining of severe asthma. He had first noticed when seventeen years old a slight difficulty in breathing, while undergoing training for school sports. Three years after he was compelled to seek medical advice. From that time the attacks became more frequent and more severe, culminating finally in such constant difficulty in breathing, with frequent nocturnal exacerbations, that for the greater part of the winter he was confined to the house. No drugs or attention to diet ever gave him any material relief, excepting hypodermic injections of morphia, which he was beginning to take very frequently. He was, on his first visit, much emaciated, with stooping shoulders, breathing audibly, especially after exertion. His lungs were free from any indications of chronic or acute bronchitis beyond the râles due to spasmodic contraction of the bronchial tubes. On examining the nose I discovered a large ecchondrosis of the septum almost filling the right nasal fossa. In spite of the obstruction the patient could breathe fairly comfortably through the left nostril. The attacks of asthma generally began in sneezing and running from the nose—a point often of value in determining, or rather suggesting, a possible relation between the nose and the asthma. I advised the removal of the obstruction, but telling the patient that I was more than doubtful whether or no it would benefit the asthma. For a few nights he sprayed a 5% solution of cocaine into the nose at the onset of the symptoms, and always obtained considerable relief therefrom. I accordingly on 12th September removed the obstruction with one of Bosworth's saws, under a general anæsthetic. From that day to this (January 1892) he has never once experienced the least suggestion of asthma. During the whole of the winter following the operation he was doing mission work, holding services in all sorts of buildings, occasionally out of doors, and in all weathers. He told me he was sometimes preaching four or five times a day. He admitted that he occasionally took cold in an ordinary manner, but never sufficiently to lay him up or to give him any difficulty in breathing.

Such a case can scarcely be explained on a theory of mere coincidence, and one cannot but assume some connection between the cure and the treatment.

CASE 48. ASTHMA WITHOUT SNEEZING DURING HAY-TIME —POST-NASAL ADENOIDS—REMOVAL AND CURE.

Mr. W. B., æt. fifteen, consulted me in November 1889, complaining of sharp attacks of asthma during the usual period of hay-fever, viz. from early in June till the end of July. They were not associated with sneezing or cough, although sufficiently severe to confine him to the house, sometimes for many days together. They had troubled him almost from infancy, although increasing in severity of late years. There was no deafness, although the post-nasal cavity was found almost completely filled with adenoid growths. These were removed under an anæsthetic: since when, during the last two summers, he has experienced not the slightest reminder of the asthmatic trouble.

In this case it was only natural to suppose that the buccal respiration was mainly accountable for the irritation of the bronchial mucous membrane, from which the nose should have been and subsequently was enabled to protect it.

CASE 49. ASTHMA, NASAL OBSTRUCTION, ANEURISM OF THE AORTA?—REMOVAL OF NASAL POLYPI FROM THE NOSE—CONSPICUOUS IMPROVEMENT IN THE ASTHMA.

Mr. R. was sent to me by Dr. Chislett in October 1889, for the purpose of having the nose examined. Dr. Chislett wrote as follows: "He has had asthma some years, and has seen many physicians about it. The last one he saw was Dr. O——, who diagnosed asthma and probably aneurism or a new growth in chest. I am inclined to think now that it is a case of enlarged bronchial glands pressing on the left bronchus and vessels and left vagus, producing the fulness of the left supraclavicular region and distension of left superficial veins of chest. There is weakness of the left radial and carotid pulse. I at first thought it was aneurism of the transverse aorta, but cannot get any bruit, though the other systems are very like it. . . . The rationale of the case appears to be this: hypersensitiveness of the mucous membrane of the nose and air-passages, obstruction of the nasal breathing, and consequent bronchitis. . . . As the affair began with a stoppage in the nose, and the other symptoms supervened upon that, I at one time thought he might have a polypus. . . . He has violent attacks of pain in the chest, cough, and dyspnœa every night," etc.

When the patient appeared he was much emaciated, scarcely able to walk a few steps without support. He said that his attacks lasted nearly the whole night, and that he seldom got any rest until daylight. The physical signs were as above described, there being no evidence of any bronchitis, although the lungs were decidedly emphysematous. The nose was almost filled with polypi, nasal respiration being impossible. There was continual running from the nose, frequent deglutition, and considerable discomfort in eating and drinking. The patient was in such a feeble condition that I hesitated to operate, and only on his and Dr. Chislett's earnest request consented to do so. After several sittings the growths were completely eradicated, the patient steadily and rapidly regaining strength and the asthmatic attacks moderating in severity as the nasal respiration was restored. His weight also steadily and slowly improved, and three months after the beginning of the treatment he could walk two or three miles with ease and pleasure. Six months after, his attacks had so far lessened in severity that without any artificial assistance he slept the greater part of each night, the duration of the asthmatic attacks, with which he was still seized every night, being not more than fifteen minutes to an hour. At the present time (November 1891) he still has his nightly attacks, although they do not last longer than ten or fifteen minutes, while he talks of the removal of the polypi as having given him a new lease of life.

INQUIRY INTO THE RELATIVE SIZE OF THE NASAL FOSSÆ AND ANTRA.

In two cases of ozæna, where it became desirable to open the antrum, I found it necessary to penetrate to an extraordinary depth in the alveolus before the cavity was reached. Hence it occurred to me that possibly an insufficient development of the maxillary sinus might account for the abnormal width of the nasal fossæ observed in these cases. I consequently made an examination of thirty skulls in the Museum of the Royal College of Surgeons, in order to ascertain whether there existed any relation between the relative sizes of these cavities. The measurement proved to be far from easy, the majority of skulls being so broken as to be worthless for the purpose. Otherwise I examined the skulls in the order in which I found them; the result being that they show pretty conclusively that some such relation does exist. The following are the numbers of the specimens examined and their measurements in 32nds of an inch; while below them are given some calculations from the measurements.

No. of Skull in the Museum.	Width of Nasal Fossa.	Depth of Antrum opposite Ostium.
326H	18·5	24
326I	16·5	36
327	20	32
135	10	33
133	18	33
132	16	32
331A	17	30
309	18	26
312	14	32
315	20	24
293	10	20 " young person "
292	17·5	26
231B	10·5	22 " child "

TABLE—*Continued.*

No. of Skull in the Museum.	Width of Nasal Fossa.	Depth of Antrum opposite Ostium.
69	20	24
72	25	24
536	17	30
538	13	48
539	19·5	23
540	20·5	26
541	17	19
542	14·5	40
543C	14	28
382	18	32
381	23	20
384	16	27
385	23	18
386	18·5	24
389	17	26
*	16	39
†	18	32

Taking the average width of the nasal fossæ to be 17·4; and taking the average size of those smaller than this number at 14·5, and of those above at 19·8, we find the corresponding sizes of the antra to be respectively 30 for the smaller nasal fossæ and 25·5 for the larger. Similarly, taking the average size of the antra to be 29, and of those below this number at 23·5, of those above at 34·5, we find the corresponding size of the nasal fossa to be for the lower number 18, and for the higher only 16.

Thus there can be little doubt that, as a rule, the smaller the antrum the larger is the nasal fossa. Consequently, assuming for the moment the theory of ozæna originating in an abnormal width of the nose to be correct, we may presume that this, in its turn, is dependent on an arrest of development in the antra, which, with the other cavities of the nose, undergo rapid enlargement towards puberty.

The above measurements, however, must not be taken to be absolutely correct, the inherent difficulties in the calculations being so great. In order to be precise it would be necessary to estimate the capacity of the maxillary cavities with shot, which would occupy more time than the investigation would be worth. The width of the nasal fossæ was estimated by measuring the distance across from one ostium maxillare to the other and then taking the mean. The depth of the antrum was taken by probing it perpendicularly from the orifice with a piece of bent wire. Consequently, the above figures must be considered as only approximately correct.

In similar manner it is quite possible that the wide space met with in cases of ozæna between the middle turbinateds and the septum may likewise be due to insufficient development of the ethmoidal cells.

If for a moment one may be allowed to theorise further without actual facts as the justification, it may prove profitable to remember the possibility of the inner wall of the antrum falling in from occlusion of the ostium, the consequence of inflammatory adhesion, etc. Just as the atmospheric pressure forces in the drum-skin of the ear, from absorption of the air within the tympanum, in cases of occlusion of the Eustachian tube, so might the outer wall of the nasal fossa be similarly affected. The point is perhaps worth further investigation.

THE RESULT OF AN EXAMINATION OF IDIOTS AND IMBECILES AT EARLSWOOD, IN REFERENCE TO THE SUPPOSED PREVALENCE OF POST-NASAL GROWTHS AND OTHER FORMS OF NASAL OBSTRUCTION AMONG THEM.

On 6th January 1890 Mr. F. G. Harvey and myself paid a visit to Earlswood Asylum, thanks to the courtesy of Dr. Robert Jones, the medical superintendent. Mr. E. F. Cooper most kindly conducted us over the institution and placed every facility in our way for making the necessary examination of the patients.

In all we examined 213 patients, the large majority of whom was composed of the worst cases. Of course it was impossible to examine such patients with instruments; while it was altogether undesirable that they should be submitted to the discomfort of a digital examination of the post-nasal chamber. In nearly all cases, however, an examination was made of the anterior nares and the buccal cavity. Of this number buccal respiration was observed in 33 individuals, or in 15 per cent. In 20 of these there was a conspicuously high-arched, V-shaped or contracted superior maxilla. Consequently, in this number there was slight additional evidence of the presence of post-nasal adenoids. On the other hand, when it is remarked that this class of patients is exceedingly prone to acute and chronic rhinitis, running from the nose being very commonly observed among them, it must be inferred that ordinary cold in the head is probably responsible for a certain amount of the buccal respiration. Moreover, Mr. Cooper assured us that snoring was only exceptionally observed among them, and that deafness was by no means common. Hence one is compelled to draw the conclusion that probably there is no connection between the aprosexia of Guye and imperfect intellectual development, at any rate as observed in these patients.

Dr. Adolf Bronner, of Bradford, has made an examination of school children with reference to the prevalence of adenoid growths.[1] He finds the symptoms present in 8 per cent, after an examination of 250 children. So that it would appear that the growths are scarcely more prevalent in children of imperfect intellectual development than in others.

Description of Figures on the Chromo-Lithographic Plate (Frontispiece).

Fig. 1. Normal appearance of the nasal fossæ as seen from in front, the alæ being distended with a Thudichum's speculum. The inferior turbinated bodies present the normal degree of turgescence of the erectile tissue.

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[1] *Brit. Med. Journ.*, September 1888, p. 487.

Fig. 2. Posterior hypertrophy of the inferior turbinated body. The almost complete absence of colour points to a certain amount of œdema, which would to a certain extent disappear under cocaine; while the finely granular surface indicates that true hypertrophy is in large part responsible for the obstructing mass.

Fig. 3. The normal appearance of the choanæ as seen in the post-rhinal mirror. The coloured illustration is given especially for the sake of enforcing the fact that the turbinated bodies, as seen from behind, are destitute of colour. The nasal fossæ are somewhat wider than is usually observed. The colouring is an admirable representation of that appertaining to a condition of health.

Fig. 4. Œdema of the posterior extremity of the inferior turbinated body with a tendency to true hypertrophy. The middle turbinateds are seen to be greatly enlarged. On the right side (that is, the left side of the figure) there is evidently some œdematous hypertrophy of the middle. Polypi had been removed from the anterior nares before the drawing was made. It will be observed that the vertical diameter of the choanæ is considerably less than that observed in Fig. 3. In this case it would be impossible to obtain a view of the superior turbinated bodies, as is often the case.

Fig. 5. Post-nasal adenoids. The appearance here is that observed when the mass presents the form of two symmetrical, rounded, though ill-defined tumours situated one on each side of a central depression. It is not the commonest appearance by any means; yet it is particularly applicable for representation, since it illustrates the fact strongly insisted upon in the text (p. 260), that the presence of the growths is sometimes only realised by their encroachment upon the upper margin of the nasal fossæ.

FORMULÆ

NASAL HAND-WASHES AND NEBULÆ.

I. ℞ Sod. bicarb., gr. xv.
Sod. biborat., gr. xv.
Acid. Carbol., gr. iv.
[Glycerine, ♏xlv.
Aq., ad ℥i.
M. ft. lotio v. nebula.

Sig.—One tablespoonful to two of warm water to be sniffed or sprayed up the nose.

This is Dobell's Solution. It is too strong for the majority of patients, half the quantities being usually sufficient. It will admit of great variation, chloride of ammonium, chlorate of potash, bromide or iodide of potassium being added according to the nature of the case.

II. To the former may be added chloride of sodium in the same proportion. It is especially valuable in cases where the mucous membrane needs stimulating.[1]

III. In the event of Form. I. proving too stimulating, and in the case of an acute, or subacute, rhinitis, the following will be found preferable :—

℞ Sod. biborat., gr. ii.—v.
Tr. Benz. Co., ♏viii.—xv.
Glycerine, ♏x.—xx.
Aq., ad ℥i.
M. ft. lotio v. neb.
Sig.—As Form. I.

IV. Where further stimulation is required, especially if the secretion is muco-purulent, the following will prove useful :—

---

[1] A patient lately told me that she found "Dr. Sage's Catarrh Remedy" more beneficial than any of the things I had prescribed ; but as she used one bottleful, costing 2s. 9d., every day, she found it expensive. Mr. Martindale, of New Cavendish Street, kindly analysed the nostrum for me. He found it consisted of 97 per cent of common salt, 2 per cent of camphor, and 1 per cent of colouring matter. This was amusing to me, as the remedy I had used most was sodium-chloride in exactly the same strength as prescribed on the bottle of this infallible cure.

℞ Sod. bicarb. }
Sod. bibor. } aa gr. xv.
Tr. Cubebæ, ♏xx.—xxx.
Acid. Carbol., gr. iv.
Glycerine, ♏xlv.
Aq., ad ℥i.
M. ft. lot. v. neb.
Sig.—As Form. I.

V. Astringent. To be used with caution, as the olfactory mucous membrane is very intolerant of all astringents.
℞ Aluminis, gr. v.
Aq., destill. ℥i.
M. ft. nebula.
Sig.—To be diluted with an equal quantity of boiling water, and sprayed into the nose for two or three minutes, twice or three times a day.

VI. For paroxysmal sneezing and rhinorrhœa. To be used with caution, as above.
℞ Acid. Chromici cryst., gr. $\frac{1}{16}$, $\frac{1}{8}$, $\frac{1}{4}$.
Aq., destill. ℥i.
Ft. nebula.
Sig.—As Form. V.

VII. As stimulant in ozæna.
℞ Tinct. Sanguinariæ Canadens., ♏v.—xxx.
Aq. tepid. Oss.
M. ft. lotio.
Sig.—To be sniffed or syringed up the nose night and morning.

VIII. Dr. Urban Pritchard's remedy for post-nasal growths.
℞ Glycerin. Acid. tannici, ʒiii.
Aq., ad ℥iii.
M. ft. inject.
Sig.—One teaspoonful to a wineglass of warm water, to be injected *down* the nose night and morning.

INHALATIONS.

IX. For acute rhinitis.
℞ Tr. Benz. Co.
Ft. vapor.
Sig.—One teaspoonful to a pint of hot water at 135° F., to be used as an inhalation for seven minutes night and morning.

X. For dry pharyngo-laryngitis.
℞ Creasoti, ♏v.
Magnes. Carb., lev. gr. iiss.
Aq., ad ʒi.
M. ft. vapor.
Sig.—As Form. IX., the temperature being 140°-145° F.

XI. As stimulant to the nasal mucous membrane in Chronic Rhinitis, Ol. Cubebæ, used as in Form. IX.

INSUFFLATIONS.

XII. Sedative.
Ferrier's Snuff.
℞ Morph. Sulph., gr. i.

$$\left.\begin{array}{l}\text{Pulv. Amyl. ex}\\ \text{Pulv. Acaciæ}\end{array}\right\}\text{aa ad ℥ss.}$$

M. ft. insuff.

A small pinch to be taken occasionally like snuff, or blown into the nose through an insufflator.

XIII. Stimulating.

$$\left.\begin{array}{l}\text{℞ Gummi Rubri}\\ \text{Pulv. Iodoform.}\\ \text{Pulv. Acaciæ}\\ \text{Pulv. Amyl. ex.}\end{array}\right\}\text{aa partes æq.}$$

M. ft. insuff.

Sig.—To be blown into the nose with an insufflator three or four times a day.

If this be found too irritating, a small quantity of morphia may be added.

XIV. For Epistaxis.

$$\left.\begin{array}{l}\text{Pulv. fol. Matico}\\ \text{Pulv. Amyl. ex.}\end{array}\right\}\text{aa}$$

M. ft. insuff.

Other astringents, such as alum, catechu, etc., may be employed in a similar manner.

XV. Trousseau's remedies for ozæna.
℞ Hydrarg. Ammoniati, gr. iv.
Pulv. Sacch. Alb., ℥ss.
M. ft. insuff.

XVI. ℞ Hydrarg. Oxidi rubr., gr. iv.
Pulv. Sacch. Alb. ℥ss.
M. ft. insuff.

Sig.—To be blown into the nose after cleansing.

OLFACTORIES.

These are best used in Martindale's Ozonic Inhaler, from which the vapours are easily drawn into the nose.

XVII. A modification of Hager-Brand's anti-catarrhal remedy.

$$\left.\begin{array}{l}\text{℞ Acid. Carbolici}\\ \text{Liq. Ammon. Fort.}\end{array}\right\}\text{aa ʒv.}$$

Spiritus Camphoræ, ℥ii.
M. ft. vapor.

Sig.—Five drops to be placed in the inhaler and used as directed. To be kept in a blue glass bottle.

XVIII. Equal parts of eucalyptus oil and pine oil may be beneficially used in a similar manner in chronic rhinitis.

OINTMENTS.

XIX. In painful swelling of the middle turbinated.
℞ Morphiæ Sulph., gr. i.—ii.
Hydrarg. oleati, 10%, ʒss.
M. ft. ung.
Sig.—To be gently rubbed over the bridge of the nose as often as necessary.

XX. In ozæna, or ulceration of the septum.
℞ Iodoformi, gr. v.—x.
Menthol, gr. iii.—v.
Lanoline, ℥ss.
Fluid vaseline, ʒss.
M. ft. ung.
Sig.—To be applied with a camel-hair brush to the interior of the nose.

XXI. Sometimes useful in spasmodic sneezing.
℞ Menthol, gr. v.
Lanoline, ℥ss.
Fluid vaseline, ʒss.
M. ft. ung.
Sig.—As Form. XX.

BUGINARIA.

The basis of the nasal bougie is gelato-glycerine. It consists of gelatine, glycerine, and water in the following proportions:—

Refined gelatine	(by weight),	5 ounces.
Glycerine	,,	6 ,,
Water	,,	6 ,,

"Soak the gelatine in the water for twelve hours[1] with occasional stirring, add the glycerine, dissolve in a water-bath, and evaporate to produce 15 ounces by weight of the gelato-glycerine. In making bougies the gelato-glycerine must be melted, the medicament added in the manner hereinafter described, and the substance poured into moulds of such a shape that each bougie has a length of eight centimetres, and is of a tapering form, the diameter of the larger end being eight millimetres, and that of the smaller extremity three millimetres."

---

[1] *Pharmacopœia of the Hospital for Diseases of the Throat*, fourth edition, 1881, p. 44.

XXII. ℞ Plumbi. acet., gr. ½.
Glycerine, ♏ii.
Solve et adde
Gelato-glycerine, gr. xl.
M.

Pour into the mould, and when solidified, remove for use.

Sig.—To be placed and allowed to dissolve in the inferior meatus.

XXIII. ℞ Morphiæ acet., gr. $\frac{1}{10}$.
Gelato-glycerine, gr. xl.
M.

Sig.—As Form. XXII.

XXIV. ℞ Bismuthi oxychloridi, gr. v.
Glycerine, ♏iii.
Tere et adde
Gelato-glycerine, gr. xl.
M.

Sig.—As Form. XXII.

MIXTURES, AND PILLS, AND POWDERS.

XXV. A Syrup of Cubebs.
℞ Ext. Cubebæ fluid, ℥ii.
Magnes. Carb., ʒss.
Pulv. Sacch. Alb., ℥xii.
Aq. flor. Aurant., ℥ii.
Aq. q.s.
Ol. Amygd. ess., gtt. i.

Rub up the fluid extract with the magnesia, and add 2 ounces of the sugar in small portions until thoroughly mixed. Then add the orange-flower water and 7 ounces of plain water, and, when the sugar is dissolved, filter, adding sufficient water to make the filtrate measure 11 ounces. In this dissolve the rest of the sugar, and finally, add the oil of almonds dissolved in 1 drachm of spirit. Dose, one to four teaspoonfuls.

XXVI. Another.
Pulv. Cubebæ, ʒiii.
Syrup. Aurant, ad ℥ii.
M.

Sig.—One teaspoonful for a dose.

XXVII. Or half to 2 drachms of the dry powder, with an equal quantity of sugar, may be taken on the tongue or in wafers. But the powder is too bulky to be acceptable in this form.

XXVIII. Sir Morell Mackenzie's pill for neurasthenics suffering from hay fever.
℞ Zinci Valerianatis, gr. i.
Pil. Assafœtidæ Co., gr. ii.
M. ft. pil. i.
Sig.—One or two pills to be taken two or three times a day.

XXIX. Sir Andrew Clark's remedy for hay fever.
℞ Glycerini Acid. Carbol., ℥i.
Quiniæ hydrochlor., ʒi.

To be dissolved with the aid of heat and one two-thousandth part of perchloride of mercury added.

To be applied with caution to the nasal mucous membrane on alternate or every three days.

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